COAL AGE

Vol. 2 NEW YORK, NOVEMBER 30, 1912 No. 22

HOW would you like to go into the mines every morning, knowing that if anything happened to prevent your earning a daily wage, your wife and children would be destitute?

Do you believe efficient work can be done by those who labor under such conditions? Is it not a disgrace to this nation, and to our greatest industry, that there are no satisfactory *Compensation* and *Liability* laws?

Can we feel proud of our achievements as a people when we trail 50 years behind Europe in matters of so great importance? Better a government ruled by a Kaiser who is human, than a democracy controlled by cast metal and stamped with the motto, "In God We Trust."

There will come a time in the history of this supposedly free country when "the few" will listen to "the many;" when a life in the mine or the mill will be as valuable as one in the office. We will then no longer dispute that the chief object of all government is to reduce want.

Some men must always do the hard manual labor; everyone cannot be boss. A lot of people will uplift civilization with their hands—a few will use only their heads. The former are not necessarily failures because they lack an abundance of worldly goods. Even the foolish know how to use riches, but it requires wisdom to know how to use poverty.

To a certain degree poverty can be eliminated by a judicious law pertaining to Employers' Liability and Workmen's Compensation in case of accidents. In framing such an act, Germany adopted the motto: "Take care of the workmen and the employers will take care of themselves." They made the saving of the employer's income dependent upon the saving of the employee's life.

There was no attempt to make special provisions for the various cases that might arise. The whole matter was summed up in one clause, namely; *unless it can be shown that the employee has wilfully injured himself, every employer must pay a fixed sum as indemnity for any injury received by a person in his employ.* No room was left for the idea that such a scheme of insurance was charity. The whole plan was advanced as one of justice and economy.

In the first two years of its existence, the new law cost German owners nearly 40 million dollars. But instead of allowing themselves to be crushed by such losses, employers engaged in similar trades followed the only sensible course—one of co-operation—and formed insurance companies to make provision for large accident liabilities.

The idea was that these companies should pay workmen's compensations out of the annual premiums contributed by the individual firms, and today these insurance bodies are the most powerful factors in the industrial system. They act as intermediaries between employer and employee, and at the same time look out for the welfare of the men.

The German insurance companies, which in reality are "mutual associations of employers," are a success. They do not try to evade their obligations, but aim to save themselves a pound of cure by providing an ounce of prevention. They began by making suggestions for preventive measures; later they assumed the authority of making them compulsory; and, finally, they enforced them through rigid mine inspection.

In our next issue we will explain how all this was accomplished without the force of the law behind the movement. How the problem was solved by a cleverly conceived sliding scale of dues, based on the safety and amount of improvements made at each mine. We will also endeavor to show that an industrial insurance law is clearly a measure regulative of interstate commerce, and that Congress has power to pass such a law, even though its ulterior object be a police regulation of our coal mines.

The C. F. & I. Co's Rockvale Mine

By J. B. Marks
and Gerald Alley*

A description of a large Western colliery, with special reference to the ventilating arrangement, in which some novel departures from the customary practice have been introduced. A steel revolving collapsible door replaces the usual double doors and permanent concrete steps have been constructed in the slope airway.

*Engineers, Colorado Fuel & Iron Co., fuel department.

The Rockvale mine of the Colorado Fuel and Iron Co. is located in the south central part of Fremont County, Colorado, about seven miles southeast of Cañon City, and three and one-half miles southwest of Florence, on a spur of the Cañon City branch of the A. T. & S. F. Ry., near the eastern outcrop of what is known as the Cañon City Coal Basin.

History of the Plant

This mine was opened up by the A. T. & S. F. Ry. Co. in the year 1880, and except for a few minor delays has been in continuous operation for the past 32 years. It was started on the room-and-pillar method, and so worked until the year 1885, when the system was changed to a modified longwall, and finally, about the year 1890, the present regular longwall system was started. The property was leased from the A. T. & S. F. Ry. by the C. F. & I. Co., in August, 1896.

The seam is reached and worked through a three-compartment shaft, 320 ft. deep, one compartment, 4½ ft. by 6 ft., being used as an air shaft, and the other two for the hoisting; a balanced hoist is used and double conical drums. The seam averages from 3½ to 4 ft. thick and dips about 5 per cent. to the northwest. Being an excellent quality of domestic bituminous coal, it is in great demand in this section of the country. It is the purpose of this article to show some of the recent improvements made by the C. F. & I. Co. in the ventilating system of this mine.

The air was formerly furnished by an 8-ft. Murphy blowing fan, but as the mine workings were enlarged a 7-ft. Stine fan was installed as a booster in the Main South entry. By referring to the photograph, Fig. 1, showing the surface works, the old fan house can be seen in the foreground.

Description of the New Ventilating Arrangement

Early in the year 1912, it was decided to put in a new fan that would have ample air capacity for all future development, and to install it at some distance from the surrounding buildings, which were so close to each other that in case of fire starting, the fan would almost certainly be destroyed. Accordingly a site 700 ft. south and on the opposite side of the cañon was selected, from which point a rock slope 7 ft. by 10 ft. was driven on a 22-deg. pitch, about 800 ft. long, to an intersection with the Main South entry.

This slope, shown in photograph, Fig. 5, and on the line drawing, Fig. 2, is to be the main airway and traveling way. A concrete stairway has been built its entire length, in sections of eight risers and a landing, with a protecting hand rail and stanchions on the inside, making an easy and safe traveling way for the men. The track is left in place for cleaning up and provides a means of entrance and exit for the mine mules, making it possible to bring the latter to the surface weekly instead of having them confined almost entirely to the underground stables. This slope also furnishes an additional escapeway from a point near the center of operations in the mine.

The Fan

The fan proper is 12 ft. in diameter by 6 ft. wide, of standard steel construction, designed and built by the C. F. & I. Co. at the Pueblo plant, and is clearly shown in plan and elevation by line drawing, Fig. 4. The fan is so arranged that it can be driven from the 75-hp., A. C. motor, or from the steam engine, by engaging or disengaging the jaw-clutch coupling shown in plan, and is fully equipped with reversing doors, explosion

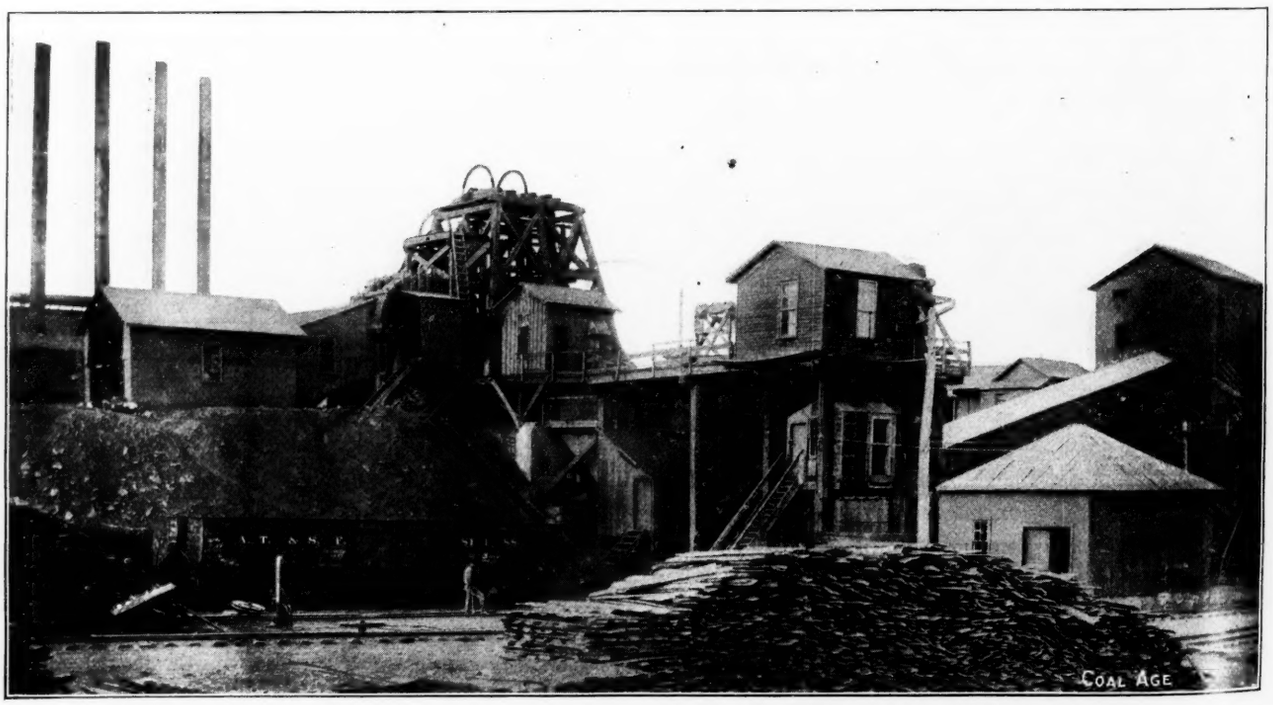


Fig. 1. General View of the Surface Plant at the Rockvale Mine, Showing the Old Fan on the Left

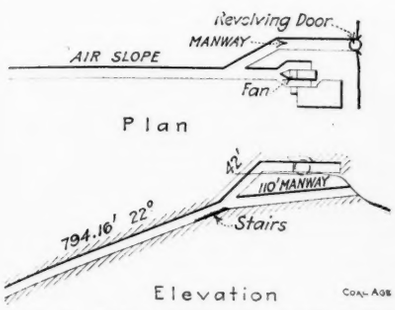


FIG. 2. FAN CONNECTION WITH THE MANWAY

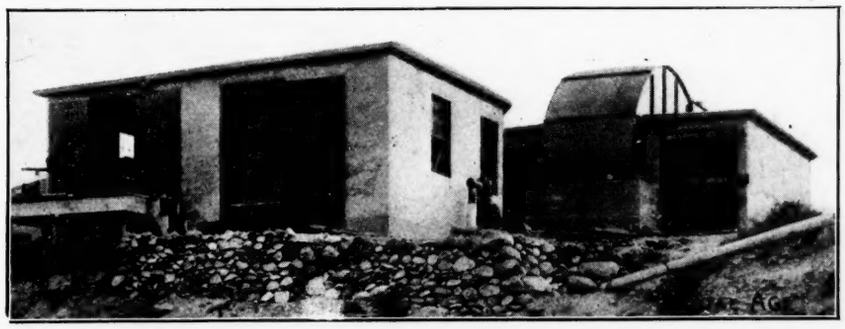


FIG. 3. VIEW OF THE NEW FAN INSTALLATION

doors, etc. It is at the present time delivering 74,000 cu.ft. of air per minute with a 3.2-in. water gage, at a speed of 170 r.p.m., although the airway has not as yet been thoroughly cleaned up.

The fan house is a substantial concrete structure with steel reinforced roof, having no inflammable material entering into the construction with the exception of window frames and outside doors. The back end of the building is shown in the photograph, Fig. 3, the fan being on the right, and the engine house, containing both the engine and motor, on the left.

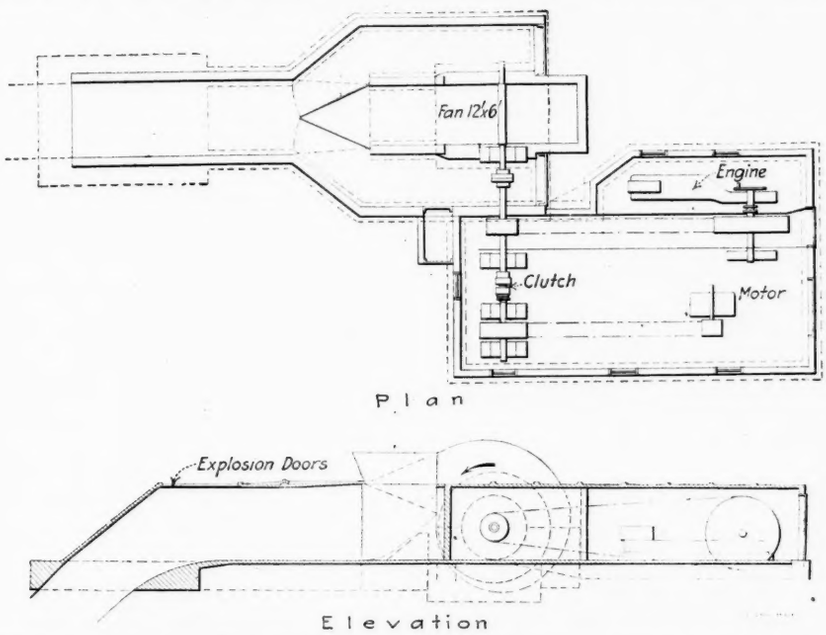


FIG. 4. THE 12-FT. FAN BUILT AT THE PUEBLO WORKS OF THE C. F. & I. CO.

THE REVOLVING DOOR

Another rather novel feature in connection with this installation is the revolving door at the entrance to the manway, indicated on the plan view, Fig. 2, and by the photograph, Fig. 7. This door is similar to the revolving vestibule doors in use in public buildings, but so far as we know, this company is the first to apply it to mine use.

The door is built of steel with four blades, forming four compartments and rotates between curved steel sides and steel top and bottom, this housing being anchored in concrete and grouted in place air tight. This gives a balanced door in any position and the edges of the blades are fitted with rubber strips to make tight joints. The axis of the door works in a step bearing, and in operating, the friction on the bearings and of the rubber

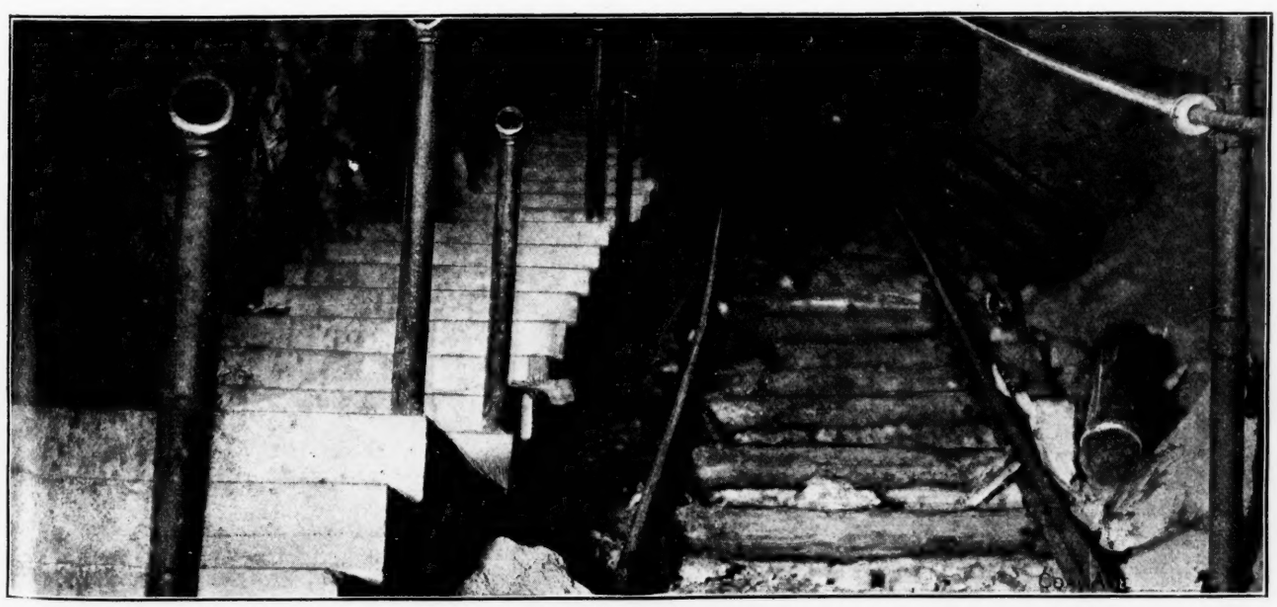


FIG. 5. THE 700-FT. ROCK SLOPE SHOWING CONCRETE STAIRWAY ON THE LEFT

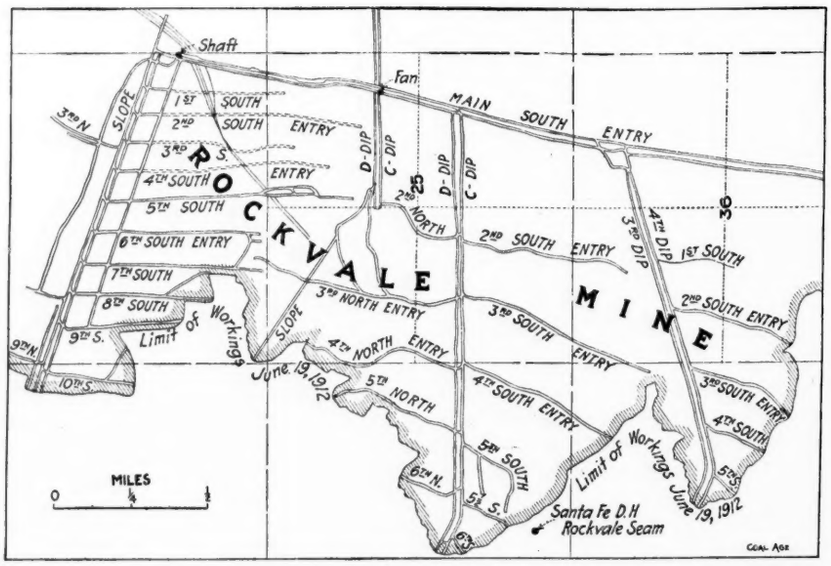


FIG. 6. SKETCH PLAN OF THE ROCKVALE MINE

against the housing is all that has to be overcome.

The advantages of this door over the two ordinary wooden doors, is apparent. In this case one is obtained that will pass the men through rapidly with a slight turning effort and without breaking the air seal. One blade is hinged so that it can be folded back and the whole door locked, which permits mules and supplies being passed through.

Henry Johns, the present superintendent of the mine, has a rather unusual record in the Rocky Mountain district, as he has worked continuously at the mine since coming to this country from Wales, 27 years ago. He was first employed as miner, then fireboss, pitboss and finally superintendent. The mine is under the general charge of J. P. Thomas, division superintendent.

The Coal Business in the West

The coal operators of the inter-mountain territory are commencing to feel the effects of the extensive development of water power in the West. For the past ten years hydro-electric engineers have been spending time and energy in convincing capital that the rivers of the West hold an immense amount of undeveloped power and only await the installation of proper machinery to convert this power into electrical energy. There is scarcely a river of any importance, but has a hydro-electric plant installed somewhere along its course. This power is distributed many miles and as the metal mines of the West furnish the best of markets, the coal operator finds his once good customer for steam coal has been induced to discard his boiler plant and install electrical machinery. This has necessarily diverted steam coals into other markets, and today there is a large surplus of this grade of coal, except at certain periods of the year. From about September until January the demand for steam coal is equal to the supply, as the sugar factories and heating plants consume large quantities.

The oil fields in California have been developed rapidly and petroleum is replacing coal on the Pacific Coast as a means of developing power. The Southern Pacific R.R., once a large consumer of coal, has converted all its locomotives into oil-burners, and the entire road from Ogden, Utah, west is operated with this type engines. All boiler and heating plants in the large buildings use oil and the coal-mine operator again finds his steam-voal market gone.

It has been unofficially announced that the United States Smelting & Refining Co. will use oil at their various mills. At present they are consuming about 6000 tons of slack coal per month.

During the development of electrical power and the oil fields, the West has been growing steadily. Small towns have doubled their population and new towns have sprung into existence, so the demand for domestic coal has kept pace with the larger production. This increased production of domestic coal has increased the output of steam coal, which has been declining in consumption; the result has been an over-production, which has now thrown this grade of coal in the byproduct class. These conditions present to the coal operator a problem that must be solved in the near future.

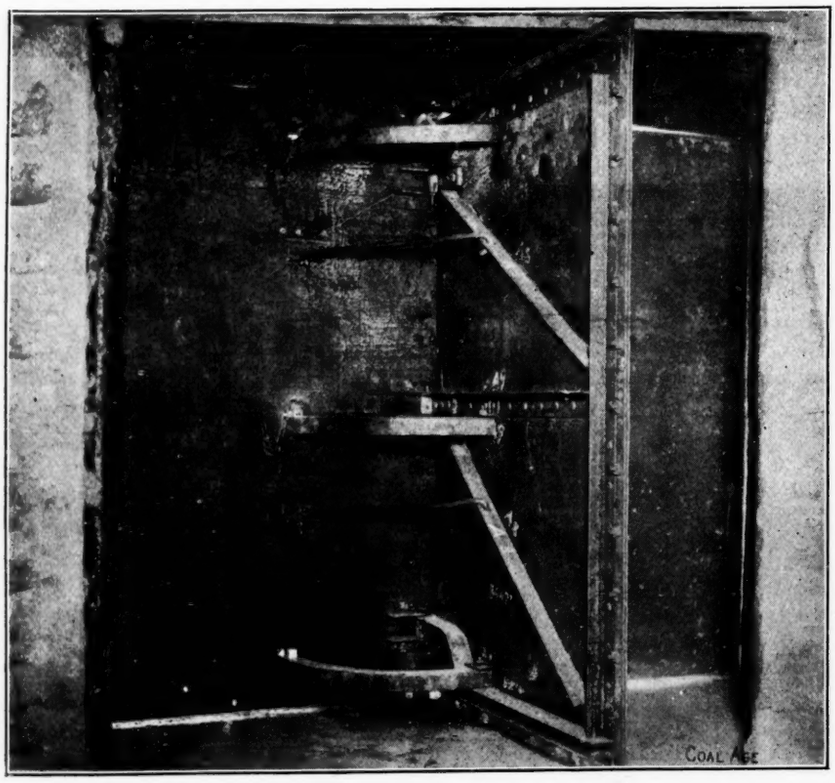


FIG. 7. VIEW OF THE STEEL REVOLVING DOOR

New Briquetting Facilities

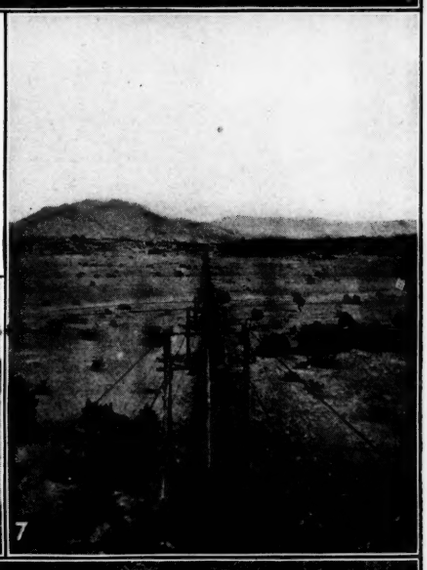
Messrs. Roberts & Schaefer Co., of Chicago, announce the employment of Charles L. Wright, who has been employed recently in the fuel-testing division of the Bureau of Mines, as the head of their reorganized coal-briquetting department.

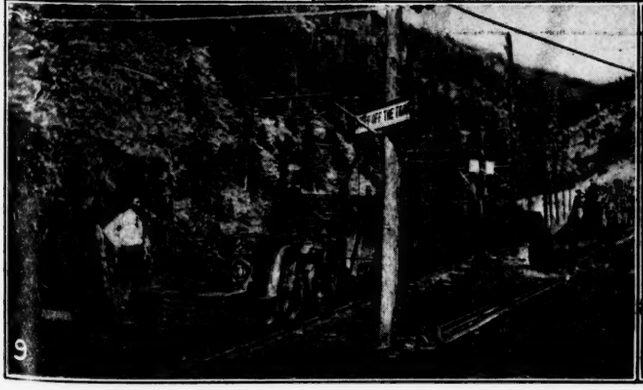
The R. and S. Co. has lately acquired an operating plant where they are prepared to make briquetting tests for prospective clients. They have also secured the exclusive United States rights for the manufacture and sale of a briquetting press of unusual merit.

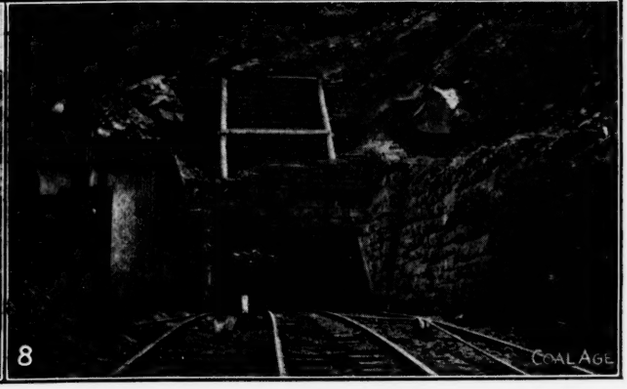
Snap Shots in Coal Mining

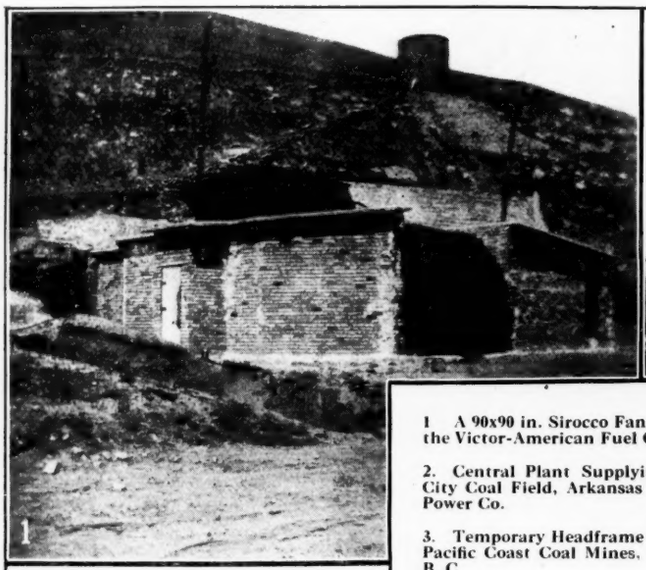
We Will Pay $5 for the Best Photograph Published Here Each Week.

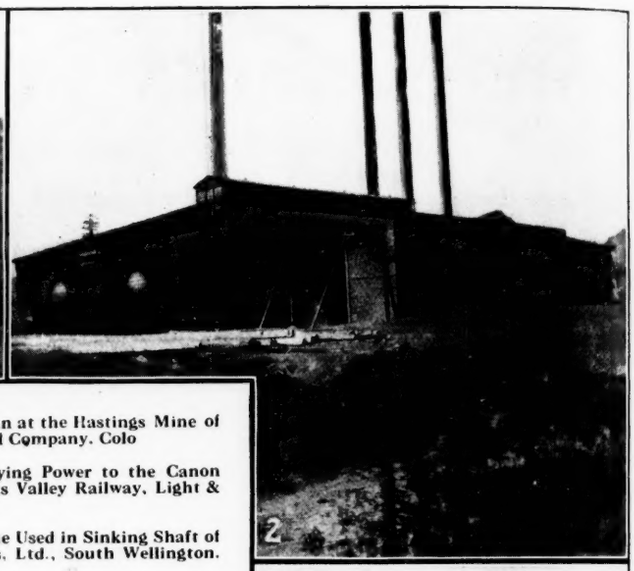
1. Kemmerer Coal Co., No. 1 Mine, Kemmerer, Wyo.
2. Rocky Mountain Fuel Co., Midland Mine, Sunlight, Colo.
3. South Side of Delagua double tipple. The largest producer in the state of Colorado.
4. Coal seam, 65 ft. thick. Located in North Park, Colo.
5. Car haul, Cass mine, Victor-American Fuel Co.
6. Navajo Indian Race at Gibson Properties of Victor-American Fuel Co. The winner made 15 miles in 1 hr. 4 min.
7. Aerial Tramway, Littell Bros. Mine, Canon City, Colo.
8. Main Opening, Black Hawk Coal Co., Blackhawk, Utah.
9. Locomotive and Trip at Castle Valley Coal Co., Mohrland, Utah.











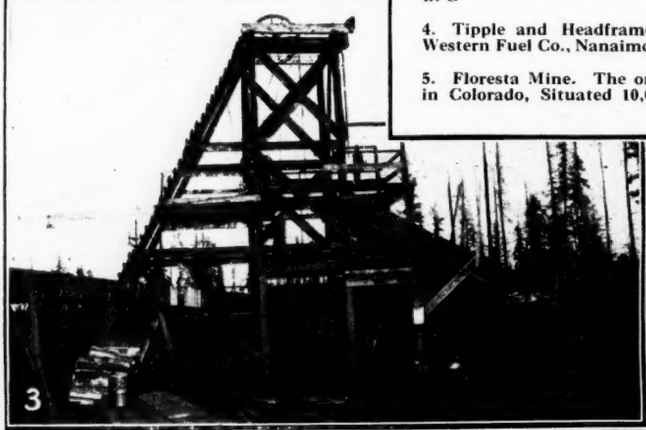
1 A 90x90 in. Sirocco Fan at the Hastings Mine of the Victor-American Fuel Company, Colo

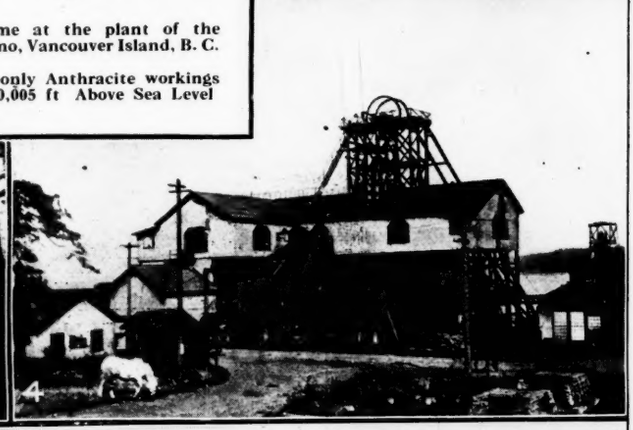
2. Central Plant Supplying Power to the Canon City Coal Field, Arkansas Valley Railway, Light & Power Co.

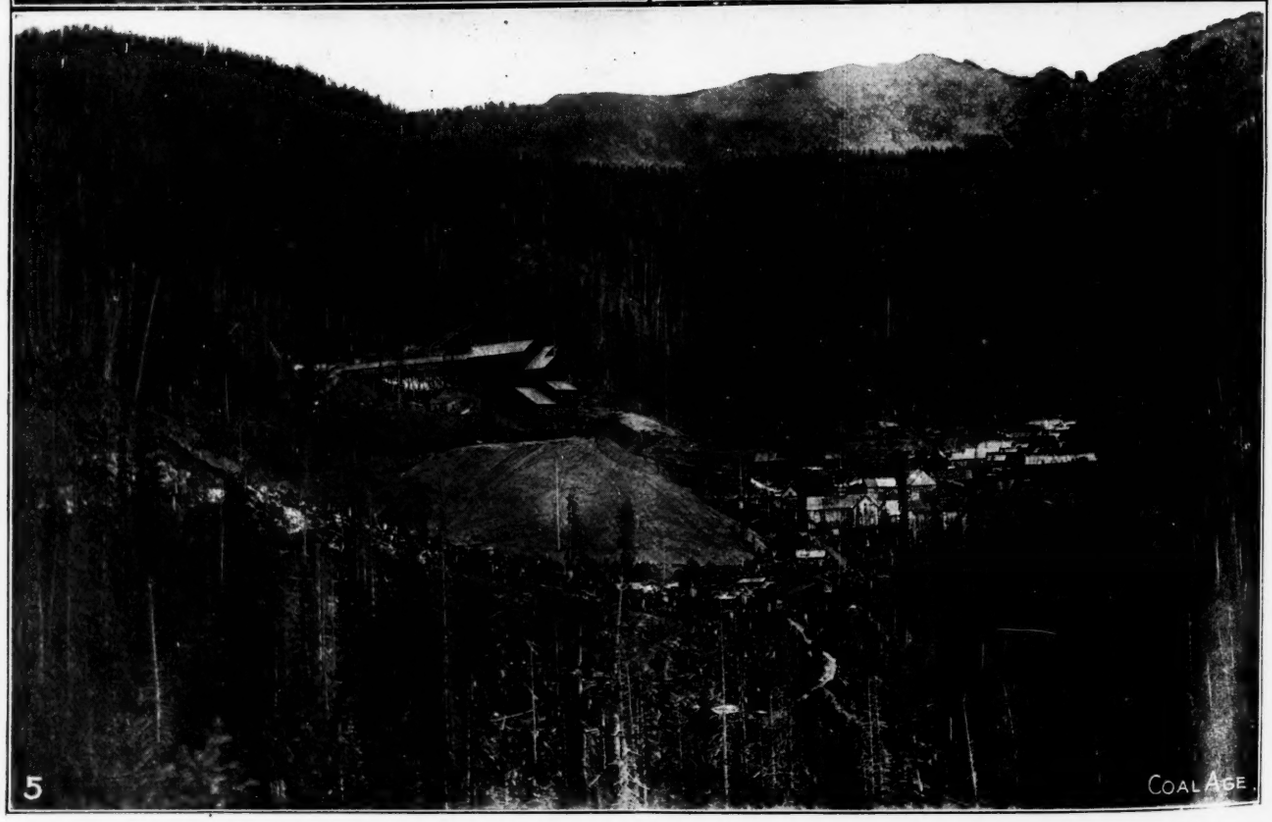
3. Temporary Headframe Used in Sinking Shaft of Pacific Coast Coal Mines, Ltd., South Wellington, B. C

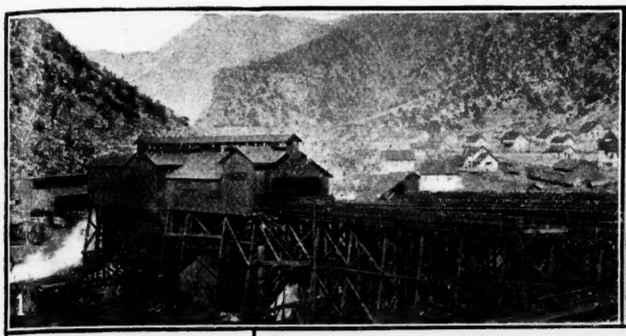
4. Tipple and Headframe at the plant of the Western Fuel Co., Nanaimo, Vancouver Island, B. C.

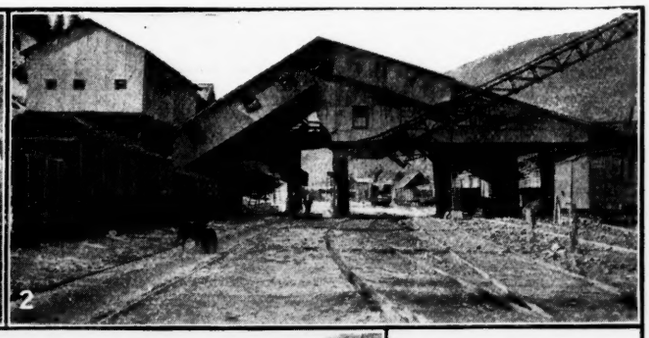
5. Floresta Mine. The only Anthracite workings in Colorado, Situated 10,005 ft Above Sea Level











1. Tipple and Screening Plant at Sunnyside, Utah. Operated by Utah Fuel Co.

2. Screening Plant at Winter Quarters, Utah. Another of the Utah Fuel Co's Plants.

3. Village of Sunnyside in Carbon County, Utah, on Denver and Rio Grande R. R.

4. Trestle for Carrying Drop Bottom R. R. Cars to Slack Hoppers of Power Plant Now Being Erected at Hastings, Col.

5. Tipple and Washery at Hastings, Las Animas County, Col. Property of the Victor American Fuel Co.

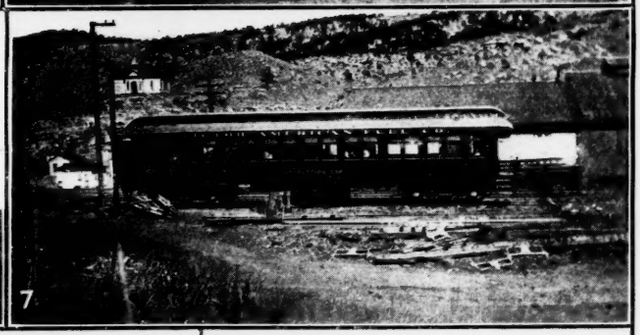
6. Tipple of the Blackhawk Coal Co., at a Mine of the Same Name near Hiawatha, Utah.

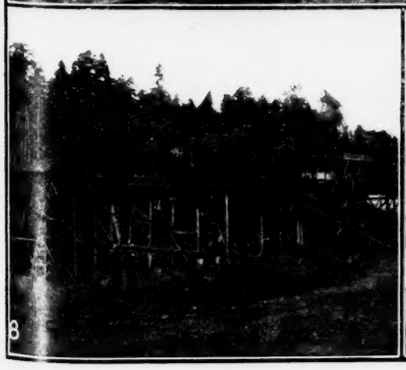
7. An Instruction Car Owned by The Victor American Fuel Co., Used for Rescue Training.

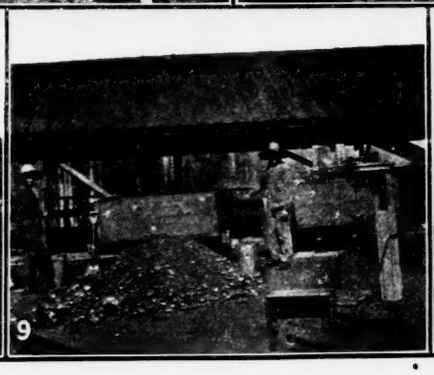
8. Tipple of Pacific Coast Coal Mines, Ltd., at South Wellington, Vancouver Is., B. C.

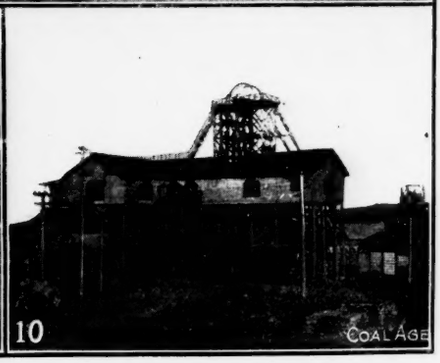
9. Chinese Coal Pickers at Work Cleaning Coal on the South Wellington Tipple.

10. Tipple and Head Frame of the Western Fuel Co., West Nanaimo, B. C. near Southern End of Vancouver Is.









Rocky Mountain Coal Mining Institute

The initial meeting of the Rocky Mountain Coal Mining Institute, held in Denver, Nov. 13, was an enthusiastic success. Practically every important mining company in the four states affected was represented. The idea of having chapters in all the important coal-mining centers is an excellent plan, and aside from insuring a large membership, will result in creating the maximum interest and in doing the most good. Accompanying this issue is a photograph taken on the Capitol steps in Denver and showing a majority of the charter members who attended the organization meeting.

The next meeting of the institute will probably be held in Salt Lake City, in June, 1913. In the meantime, COAL AGE will publish the most interesting papers read at the chapter meetings in the different states. All coal men in Colorado, Wyoming, Utah and New Mexico who have not already become charter members of the new organization, and who wish to join, are requested to send their names to Mr. Weitzel, the president, or to the vice-president, in their respective states. A full account of the meeting follows:

MEETING OF ORGANIZATION COMMITTEE

At 10 a.m. Tuesday, Nov. 12, 1912, the following members of the committee appointed by COAL AGE to organize a coal-mining institute for the Rocky Mountain region, met in the State Capitol, at Denver, Colo.:

E. H. Weitzel,
W. J. Murray,
T. H. O'Brien,
W. B. Williams,
James Dalrymple,
F. W. Whiteside,
A. C. Watts,
David Griffiths.

The following members of the committee were not present:

Frank Manley,
H. C. Williams,
J. E. Pettit,
Allan French,
Frank Cameron,
D. W. Brown,
C. H. Gibbs.

E. H. Weitzel acted as chairman of the meeting.

This committee drew up a form of constitution and by-laws, to be recommended to the general meeting to be held on the following day; and, with the exception of two alterations, this constitution and by-laws, formulated by the organization committee, was accepted as a whole by the general meeting.

With the exception of a general discussion of affairs that might be brought out by means of such an institute, no further business was done at this meeting of the organization committee, and it was adjourned.

Special Correspondence

Full account of the proceedings of the organization meeting, and including copy of constitution and by-laws as adopted. The new institute plans to organize chapters in the different camps. Starts off with more than 200 charter members.

MINUTES OF THE FIRST MEETING OF THE ROCKY MOUNTAIN COAL-MINING INSTITUTE

The meeting was held in the State Capitol at Denver, Colo.; and was called to order at 10 a.m. Wednesday, Nov. 13, 1912, by Acting Chairman E. H. Weitzel.

There were present at the meeting 128 men who signified their willingness to sign a constitution and by-laws similar to the one drafted by the organization committee.

After the constitution and by-laws was read as a whole, it was then taken up article by article and section by section, with due consideration and argument; and the following is the complete constitution and by-laws as adopted by the meeting:

CONSTITUTION

Article I

The name of this association shall be The Rocky Mountain Coal-Mining Institute, and shall comprise the States of Colorado, New Mexico, Utah, and Wyoming. Its objects shall be the increase and diffusion of knowledge relating to coal mining, to encourage education in practical and scientific mining, to promote study and research into mining problems and to advance the mutual interests of its membership.

Article II

Any person who is directly engaged or interested in some branch of coal mining may become a member of this institute by consent of a majority of the members present at any stated meeting; and others may be elected honorary members at the discretion of the institute.

Article III

The officers of this institute shall consist of a president, four vice-presidents, one to be elected from each state in which the institute operates; a secretary-treasurer, and an executive board of 13 members, consisting of the president, the four vice-presidents, and two other members from each state in which the institute operates.

Article IV

The officers and executive board shall be elected by ballot at the regular November meeting of the institute, and shall hold office for one year.

Article V

Any person desiring to become a member shall make application to the executive board, such application to be signed by two members of the institute in good standing, who shall vouch for the eligibility of the applicant; and such application shall be presented at the next meeting of the institute, and shall be accompanied by the membership dues.

Article VI

Any member who is in arrears for dues for two years shall be dropped from the roll of this institute by the secretary after due notification. A member so dropped may be reinstated by making application in the regular manner provided in Article V, upon the payment of back dues.

Article VII

The regular meetings of this institute shall be held in the first half of June and the last half of November of each year.

Article VIII

In case of death, resignation, or expulsion of any officer, the executive board may fill the vacancy by appointment until the next regular meeting of the institute, when the vacancy shall be regularly filled by election; except in the case of death, resignation or expulsion of the president, when the duties shall then devolve upon the oldest vice-president in point of years.

Article IX

Duties of Officers.

Section 1. The president shall immediately upon his election perform the duties of a presiding officer and chairman of this institute. He shall also sign all orders for the payment of money.

Section 2. The duty of the vice-presidents shall be to preside in the absence of the president; to perform all the duties prescribed to the president during his absence; and in case of absence of the president, the senior vice-president in point of years shall perform the duties of the president.

Section 3. The secretary-treasurer shall keep a record of each meeting, and shall read the minutes when so requested by the chairman. He must read and file all resolutions and papers which may come before the body, and allow none to go from his custody without due authority. He shall countersign all orders for money which have been signed by the president. He shall order necessary supplies and account for the same to the executive board. He shall also keep a true record of all cash received by him, and payments made on account of this institute. He must pay out no money except on an order signed by the president, and countersigned by himself. He shall retain these orders as his vouchers, and he shall give bond in the sum of one thousand dollars ($1000), the premium on said bond to be paid by the institute. The secretary-treasurer shall receive a salary of at least one hundred dollars ($100) per annum. He shall turn over all money due this institute and his books, in good order, to his successor at the expiration of his term as secretary-treasurer.

Section 4. It shall be the duty of the executive board to pass on applications for membership; to determine the place of meetings and the days on which the meetings shall be held; to arrange and approve programs for meetings, and approve all papers to be read before the institute. Special meetings may be called

in cases of emergency by the executive board by giving not less than 15 days' notice in writing to each member.

The executive board shall have authority to appoint a person or persons in each mining camp to organize a chapter or chapters of this institute, this duty for each state being performed by the members of the executive board from the state in which the camp is located. The members of these chapters shall become regular members of the institute as soon as their dues are paid, and they are accepted by the institute.

Section 5. The president shall appoint an auditing committee annually to properly audit the accounts of the secretary-treasurer to be submitted at the November meeting of the institute.

Article X

The membership dues of this institute shall be two dollars ($2) per year, payable in advance.

Article XI

The constitution and bylaws of this institute may be altered or amended at any stated meeting by two-thirds vote of the members present; provided notice in writing has been given at a previous semiannual stated meeting of said proposed change, alteration or amendment.

Article XII

At all meetings, the following shall be the order of business:

a. Reading of minutes of last meeting.
b. Reports of officers.
c. Reports of standing committees.
d. Reports of special committees.
e. Unfinished business.
f. New business.
g. Election and acceptance of members.
h. Program.
i. Election of officers.
j. Adjournment.

The order of business may be changed at any meeting by a majority vote of the members present.

"Roberts' Rules of Order" shall govern the proceedings of the meetings of this institute.

BYLAWS

Article I

All papers and all discussions at meetings of this institute must be nonpartisan, nonpolitical and nonsectarian.

ELECTION OF OFFICERS

All those present at the meeting signed their names to the constitution; and the institute then proceeded to the election of its officers.

Upon motions duly made and seconded, the following persons were elected by ballot as officers of the institute for the first year:

E. H. Weitzel, president, Pueblo, Colo.
W. J. Murray, vice-president from Colorado.
T. H. O'Brien, vice-president from New Mexico.
W. B. Williams, vice-president from Utah.
Frank A. Manley, vice-president from Wyoming.
F. W. Whiteside, secretary-treasurer.
John P. Thomas, executive board member from Colorado.
C. W. Babcock, executive board member from Colorado.
Allan French, executive board member from New Mexico.
D. H. Somerville, executive board member from New Mexico.
F. N. Cameron, executive board member from Utah.
J. E. Pettit, executive board member from Utah.
P. J. Quealy, executive board member from Wyoming.
H. C. Campbell, executive board member from Wyoming.

Upon motion duly made and seconded, the following resolution was passed:

Resolved, that the charter members of this institute shall consist of the members who have already signed the constitution; those whose names have been read from the list of applicants, and any other persons who apply for membership to the executive board before Dec. 1, 1912; provided their dues are paid before Dec. 1, 1912.

Upon motion duly made and seconded, the following resolution was passed:

Resolved, that a vote of thanks be given to W. F. Murray, as the one who suggested to Coal Age the formation of this institute; and to Coal Age and Floyd W. Parsons, editor, for the great assistance they have given in the formation of this institute.

Upon motion duly made and seconded, the following resolution was adopted:

Resolved, that Floyd W. Parsons be made an honorary life member of this institute without dues.

INTERESTING DISCUSSIONS

B. J. Mattison, assistant manager, fuel department, Colorado Fuel & Iron Co., next gave an interesting talk upon the dust-explosion experiments conducted at Bruceton, Penn., recently, illustrating his talk with a chart, showing the underground workings with various stoppings, etc. He also gave a short address upon a humidifying system in use by his company, illustrating by means of a drawing of one of their installations, located at Starkville, Colo. (For description of this system see p. 755.)

Motion was duly made, seconded and carried that a vote of thanks be extended to Mr. Mattison.

David Griffiths, superintendent of the Colorado Fuel & Iron Co.'s Monac mine, near Cañon City, Colo., next read a paper upon the work of the Coal Mining Institute, and its relation to the education of the press, the operator and the miner. (See p. 753.)

Motion was duly made, seconded and carried that a vote of thanks be extended to Mr. Griffiths.

Motion was duly made, seconded and carried that the secretary write the Governor of Colorado, and the Board of Capitol Managers, extending to them the thanks and appreciation of the institute for the use of the House Chambers in the Capitol Building.

James Dalrymple, state coal-mine inspector of Colorado, next read a compilation of statistics, covering coal-mining casualities. He showed that the greatest number of fatalities underground resulted from improper timbering, and suggested more stringent laws.

Motion was duly made, seconded and carried that John McNiel, formerly state coal-mine inspector of Colorado, be requested to read a paper at the next meeting of the institute.

There being no further business, the meeting adjourned, after the following letter from the Rocky Mountain Public Health Association had been read by the secretary:

The Rocky Mountain Coal Mining Institute,
State Capitol,
Denver, Colo.

Gentlemen:

The Rocky Mountain Public Health Association extends greetings to your association, and tenders its coöperation in every way in matters of the health and safety of those engaged in the mining industries in this district.

On behalf of this association, I am,
(Signed) S. Poulterer Morris,
Executive Secretary.

Charter Members of the Rocky Mountain Coal Mining Institute

The following is an official list of those who have become charter members of the Rocky Mountain Coal Mining Institute:

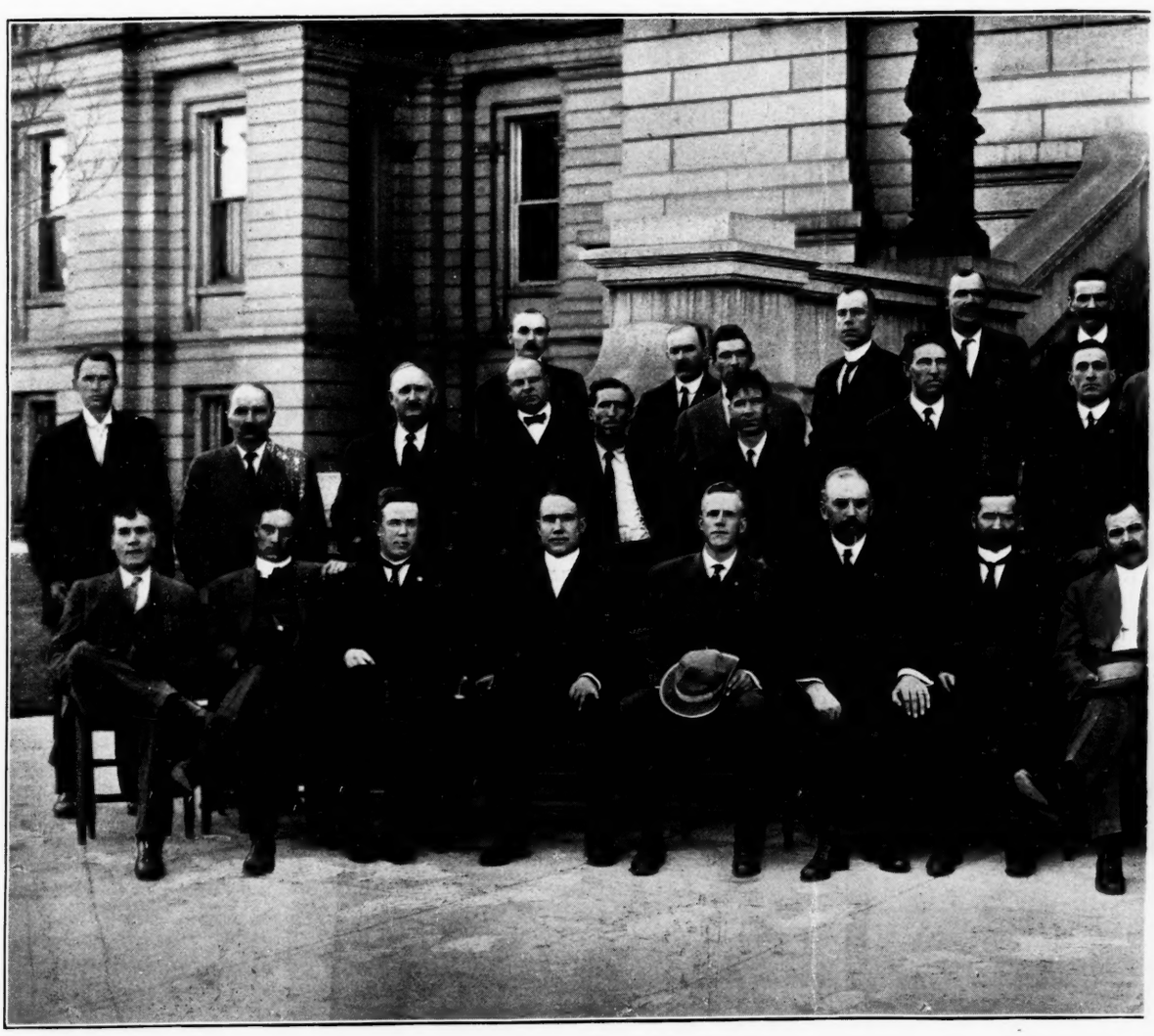
COLORADO

Allen, Carl A., Asst. Prof. of Mining, Colorado School of Mines, Golden.
Alley, Gerald, Chief Draftsman, Fuel Dept., Colorado Fuel & Iron Co., Pueblo.
Anderson, A. E., Denver.
Anderson, C. W., Leyden.
Anderson, D. L., Coal Creek.
Addison, Herbert, Vice-pres. Big Horn Collieries Co., Denver.
Adamson, W. H. ,Mine Examiner, Leyden Coal Co., Leyden.
Arnott, John, Supt., Colorado Fuel & Iron Co., Crested Butte.
Brock, Henry, Miner, Leyden Coal Co., Leyden.
Buff, H. H., Machine Runner, Carbon Coal & Coke Co., Cokedale.
Beere, W. J., Pit Boss, Victor-American Fuel Co., Maitland.
Berryman, Chas. H., Secretary-Treasurer, Southern Superior Fuel Co., Denver.
Bowie, Alexander, General Manager, Juanito Coal & Coke Co., Bowie.
Boyd, J. J., Superintendent, Summit Fuel Co., Louisville.
Bickerton, Richard, Mine Foreman, Colorado Fuel & Iron Co., Tabasco.
Brooks, Alex. J., Arvadao.
Beach, Ben., Superintendent, Colorado Fuel & Iron Co., Coal Creek.
Brown, D. W., Vice-President, Rocky Mountain Fuel Co., Denver.
Bock, Henry, Box 1602, Denver.
Bostwick, Fred H. Wellman-Seaver-Morgan Co., Denver.
Bowie, Wallace D., Bowie.
Beuchat, Chas., Pryor.
Bowen, James V., Denver.
Ball, Jos., Walsenburg.
Babcock, C. W., Denver.
Breen, J. P., Walsenburg.
Cook, O. C., Asst. Gen. Supt., National Fuel Co., Trinidad.
Cameron, James, Supt., Victor-American Fuel Co., Hastings.
Cander, George, Engineer, New Maitland Coal Co., Walsenburg.

Cannon, D. A., President, Alliance Coal Co., Denver.
Chapin, N. J., Supt., Machy. Victor-American Fuel Co., Denver.
Cox, Roy, Denver.
Cameron, D. B., Denver.
Cummings, J. W., Glenwood Springs.
Cannon, L. B., Denver.
Connell, John, Pres., Tioga Coal Co., Denver.
Chambers, Chas., Sopris.
Cameron, J. E., Midland Hotel, Denver.
Craise, Fred A., Denver.
Dennison, Arthur, Trinidad.
Dunmire, John H., Supt., Rugby Fuel Co., Rugby.
Davis, T. P., Supt., Cameron Mine, Colorado Fuel & Iron Co., Farr.
Davis, C. G., Auditor, Rugby Fuel Co., Denver.
Dean, Samuel, Mine Inspector, Victor-American Fuel Co., Delagua.
Dalrymple, James, State Coal Mine Inspector, Denver.
Dunlevy, F. S., Asst. Engineer, Victor-American Fuel Co., Hastings.
Douglas, L. R., Trinidad.
Danford, W. E., Segundo.
Denman, Henry, Lafayette.
Deck, W. G., Rouse.
Dennison, Arthur, Trinidad.
Danford, M. O., Danford & Sanderson, Trinidad.
Dunford, Sam, Walsenburg.
Evans, D. E., 401 17th St., Denver.
Ferguson, W. C., General Superintendent, The Calumet Fuel Co., Denver.
Field, Frank R., Manager, Denver Branch, Jeffrey Mfg. Co., Denver.
Featherstone, Jno. G., Williamsburg.
Friend, L. H., Pueblo.
Fortune, Geo., Primero.
Griffiths, David J., Chief Inspector, Victor-American Fuel Co., Trinidad.
Griffiths, David, Superintendent, Nonac Mine, Colorado Fuel & Iron Co., Cañon City.
Getchell, W. S., Coal Creek.
Graham, Jas. W., P. O. Box 25, Lafayette.
Gibson, Joseph, Leyden.
Hanes, J. E., Asst. Engr., Victor-American Fuel Co., Hastings.
Hufty, Lewis, Asst. Engr., Victor-American Fuel Co., Walsenburg.
House, W. B., The Rooney White Ash Coal Co., Denver.
Hosea, R. M., Chief Engineer, Colorado Fuel & Iron Co., Pueblo.
Harrington, D. M., G. M. Cedar Hill Coal & Coke Co., Denver.
Hilton, Thos., Louisville.
Hurlbut, H., Denver.
Hopkins, B. M., Lafayette.
Haske, Jos., Primero.
Harrington, Orville, Golden.
Jansen, Elmer V., Shot Firer, Carbon Coal & Coke Co., Cokedale.
Jones, Jno. D., General Manager, Oakdale Coal Co., Oakview.
Johns, Henry, Rockvale.
Jenkins, J. R., Morley.
Ketchum, M. S., Prof. of Civil Engineering, University of Colorado, Boulder.
King, Henry, Coal Mine Inspector, State of Colorado, Denver.
Knill, Thomas J., Surveyor, American Fuel Co., Lafayette.
Kilpatrick, James, Fire Boss, Colorado Fuel & Iron Co., Tabasco.
King, John McG., Sales Agent, Jno. A. Roebling's Sons Co., 1635 Seventeenth St., Denver.
Koch, W. F., Du Pont Powder Co., Denver.
Keeler, W. E., Denver.
Kimball, Geo. D., Denver.
Lloyd, Wm. B., 404 East 7th St., Trinidad.
Lawrence, J. C., Machinist, Colorado Fuel & Iron Co., Starkville.
Lippis, John, Supt., Brookside Mine, Cañon City.
Lloyd, John D., 610½ Main St., Cañon City.
Laurie, W. M., Mine Foreman, Leyden Coal Co., Leyden.
MacAllister, R. A., Mine Inspector, Colorado Fuel & Iron Co., Trinidad.
Miller, F. L., Div. Engr., Colorado Fuel & Iron Co., Trinidad.
Murray, W. F., Superintendent, Cass Mine, Victor-American Fuel Co., Delagua.
McFadden, H. B., Superintendent, Big Four Coal Co., Tioga.
Moore, C. W., Mine Clerk, Rocky Mountain Fuel Co., Superior.
Manley, Lee, Mine Foreman, Colorado Fuel & Iron Co., Coal Creek.
McLaughlin, J. E., Manager, The McLaughlin Bros. Coal Co., Trinidad.
Mellinger, Irving, Manager, Edge Vein Coal Mining Co., Morrison.
Miller, J. S., General Manager, Southern Superior Fuel Co., Denver.
McDowell, John, Secy., Supt., Alliance Coal Co., Oakview.
Magraw, R. M., Mine Supt., Utah Fuel Co., Somerset.
McCune, Robert, Shot Firer, Victor-American Fuel Co., Delagua.
Mattison, B. J., Asst. Mgr., Fuel Dept., Colorado Fuel & Iron Co., Pueblo.
Marks, John B., Mech. Engr., Fuel Dept., Colorado Fuel & Iron Co., Pueblo.
Murray, W. J., Vice-Pres. and Gen. Mgr., Victor-American Fuel Co., Denver.
McDermott, Wm., Gen. Supt., Victor-American Fuel Co., Trinidad.
McKeown, M. J., Cedar Hurst.
McNeil, John, Denver.
Morgan, Wm., Trinidad.
Murch, C. H., Walsenburg.
McKee, J. Q., Pueblo.
Musgrave, Anthony, Denver.
Morris, W. J., National Fuse & Powder Co., Denver.
McFarlane, Geo. C., 503 Gas & Electric Bldg., Denver.
Nichol, Robert, Gen. Supt., Chicosa Fuel Co., Forbes.
Nash, H. F., Vice-Pres., Oakdale Coal Co., Denver.
Newcomb, L. A., Haulage Engineer, Leyden Coal Co., 4236 Tennyson St., Denver.
O'Neil, James, Supt., Southwestern Fuel Co., Higgins.
O'Neil, Charles, Supt., Colorado Fuel & Iron Co., Tabasco.
Osgood, John C., Chairman of Board, Victor-American Fuel Co., Denver.
Oberding, Frank N., Louisville.
Perry, R. M., Gen. Supt., The Moffat Coal Co., Oak Creek.
Peet, Chas. H., Supt., Walsenburg Fuel Co., Walsenburg.
Phister, C. S., Grand Junction Mining & Fuel Co., Denver.
Parker, Geo. B., Frederick.
Parker, Geo., Valdez.
Perry, J. G., 503 Gas & Electric Bldg., Denver.
Peart, Geo. T., Denver.
Reef, Augustus J., Asst. Chief Engr., Victor-American Fuel Co., Denver.
Robbins, J. F., Superintendent, National Fuel Co., Denver.
Rees, Jno., Superintendent, South Cañon Coal Co., South Cañon.
Rees, Daniel, Miner, Victor-American Fuel Co., Bowen.
Resher, John C., Trinidad.
Roberts, J. C., Denver.
Robinson, A. H., Tercio.
Sultz, Dan, Supt., Rocky Mountain Fuel Co., Lafayette.
Snodgrass, B. W., Mine Supt., Victor-American Fuel Co., Delagua.
Shubart, Benedict, Lindrooth, Shubert & Co., Denver.
Shaw, Jno., Mine Supt., Victor-American Fuel Co., Maitland.
Salberg, J., Westinghouse E. & M. Co., Denver.
Shumway, E. E., Pres., Rocky Mountain Fuel Co., Denver.
Sharp, P. F., 1850 Bellaire St., Denver.
Smith, H. H., Leyden.
Spingler, Harry, Colorado Springs.
Sanderson, H. M., Mining Engineer, Trinidad.
Shumway, Ralph, Chief Engr., Rocky Mountain Fuel Co., Denver.
Stout, D. A., Division Engineer, Colorado Fuel & Iron Co., Walsenburg.
Sutherland, D. W., Supt. of Construction, Colorado Fuel & Iron Co., Trinidad.
Smith, L. O., Ideal.
Thomas, W. S., Trinidad.
Tweeddale, Thos. W., Mine Foreman, Colorado Fuel & Iron Co., Tercio.
Thompson, J. S., Div. Supt., Colorado Fuel & Iron Co., Trinidad.
Thompson, George S., General Electrician, Colorado Fuel & Iron Co., Pueblo.
Tenant, H. F., Tolerburg.
Thompson, S. M., Walsenburg.
Tescher, Samuel, Denver.
Thomas, J. P., Cañon City.
Tyson, W. J., Ideal.
Ullrich, E. J., Pres., El Paso County Land & Fuel Co., Colorado Springs.
Visich, P., Ideal.
Van Mater, H., Pres., National Fuel Co., Denver.
Watson, Jos., Louisville.
White, George, Supt., Russell Gates Mining Co., Louisville.
Whiteside, Frederick W., Chief Engr., Victor-American Fuel Co., Denver.
White, C. C., Mining Engineer, Calumet Fuel Co., Perins.
West, Wm., Mine Foreman, Victor-American Fuel Co., Delagua.
Weitzel, E. H., Mgr., Fuel Dept., Colorado Fuel & Iron Co., Pueblo.
Welborn, J. F., President, Colorado Fuel & Iron Co., Denver.
Wallace, Robert, M. C. Leyden Coal Co., 3133 Irving St., Denver.
Wilson, James, Supt., Colorado Fuel & Iron Co., Starkville.
Wheeler, W. H., Berwind.
Williams, Jake, Louisville.
Zook, Ira D., Supt., Rocky Mountain Fuel Co., Majestic.

NEW MEXICO

Breen, Henry, Miner, St. L. R. M. & P. Co., Sugarite.
Enright, W. C., Chief Engineer, Victor-American Fuel Co., Gibson.
French, Allan, Gen. Supt., St. L. R. M. & P. Co., Raton.
French, Archie P., Mine Foreman, St. Louis, Rocky Mountain & Pacific Co., Van Houten.
Forman, Sebastian, Fire Boss, Stag Canon Fuel Co., Dawson.
Husband, Tom, Mine Foreman, Victor-American Fuel Co., Gibson.
Hart, John, Carthage.
Harvey, Thos C., Mine Inspector, St. L. R. M. & P. Co., Koehler.
Jennings, John, Superintendent, Barlett Mine, Victor-American Fuel Co., Gibson.



not bear the desired fruit. So in order to make the Western Institute a success, we must not only start it off in good shape, but we must keep on adding to its strength in various ways, so that it will become a known factor and a recognized power over this broad territory.

There are many ways by which this organization can be made beneficial to the men engaged, in various capacities, that are handling the "dusky diamond." I will endeavor to confine my brief remarks to the necessity of a crusade of an educational nature among three classes of men mouths.

But to come to the masses engaged in coal mining, to get these men of various nationalities educated in the mining law will be a difficult task indeed, but I think I have an original scheme that is practical, and which, if put in operation,

, Geo. D., Denver.
Wm. B., 401 East 7th St., Trini-

cc, J. C., Machinist, Colorado Iron Co., Starkville.
John, Supt., Brookside Mine, y.
John D., 610½ Main St., Cañon

W. M., Mine Foreman, Leyden Leyden.
ster, R. A., Mine Inspector, Fuel & Iron Co., Trinidad.
P. L., Div. Engr., Colorado Fuel o., Trinidad.
, W. F., Superintendent, Cass tor-American Fuel Co., Delagua.
len, H. B., Superintendent, Big el Co., Tioga.
C. W., Mine Clerk, Rocky Moun- l Co., Superior.
, Lee, Mine Foreman, Colorado ron Co., Coal Creek.
hlin, J. E., Manager, The Mc- Bros. Coal Co., Trinidad.
er, Irving, Manager, Edge Vein ning Co., Morrison.
J. S., General Manager, South- rior Fuel Co., Denver.
ell, John, Secy., Supt., Alliance Oakview.
W. R. M., Mine Supt., Utah Fuel ersel.
e, Robert, Shot Firer, Victor- n Fuel Co., Delagua.
on, B. J., Asst. Mgr., Fuel Dept., Fuel & Iron Co., Pueblo.
John B., Mech. Engr., Fuel olorado Fuel & Iron Co., Pueblo.
W. J., Vice-Pres. and Gen. tor-American Fuel Co., Denver.
mott, Wm., Gen. Supt., Victor- n Fuel Co., Trinidad.
wn, M. J., Cedar Hurst.
, John, Denver.
n, Wm., Trinidad.
, C. H., Walsenburg.
, J. Q., Pueblo.
ave, Anthony, Denver.
, W. J., National Fuse & Pow- Denver.
lane, Geo. C., 503 Gas & Electric enver.
, Robert, Gen. Supt., Chicosa ., Forbes.
H. F., Vice-Pres., Oakdale Coal ver.
mb, L. A., Haulage Engineer, Coal Co., 4236 Tennyson St., Den-

, James, Supt., Southwestern ., Higgins.
, Charles, Supt., Colorado Fuel & ., Tabasco.
d, John C., Chairman of Board, American Fuel Co., Denver.
ing, Frank N., Louisville.
, R. M., Gen. Supt., The Moffat ., Oak Creek.
Chas. H., Supt., Walsenburg Fuel lsenburg.
r, C. S., Grand Junction Mining Co., Denver.
r, Geo. B., Frederick.
r, Geo., Valdez.
, J. G., 503 Gas & Electric Bldg.,

Geo. T., Denver.
Augustus J., Asst. Chief Engr., American Fuel Co., Denver.
os. J. F., Superintendent, Na- Fuel Co., Denver.
Jno., Superintendent, South Coal Co., South Cañon.
Daniel, Miner, Victor-American , Bowen.

Resher, John C., Trinidad.
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Shumway, Ralph, Chief Engr., Rocky Mountain Fuel Co., Denver.
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Sutherland, D. W., Supt. of Construction, Colorado Fuel & Iron Co., Trinidad.
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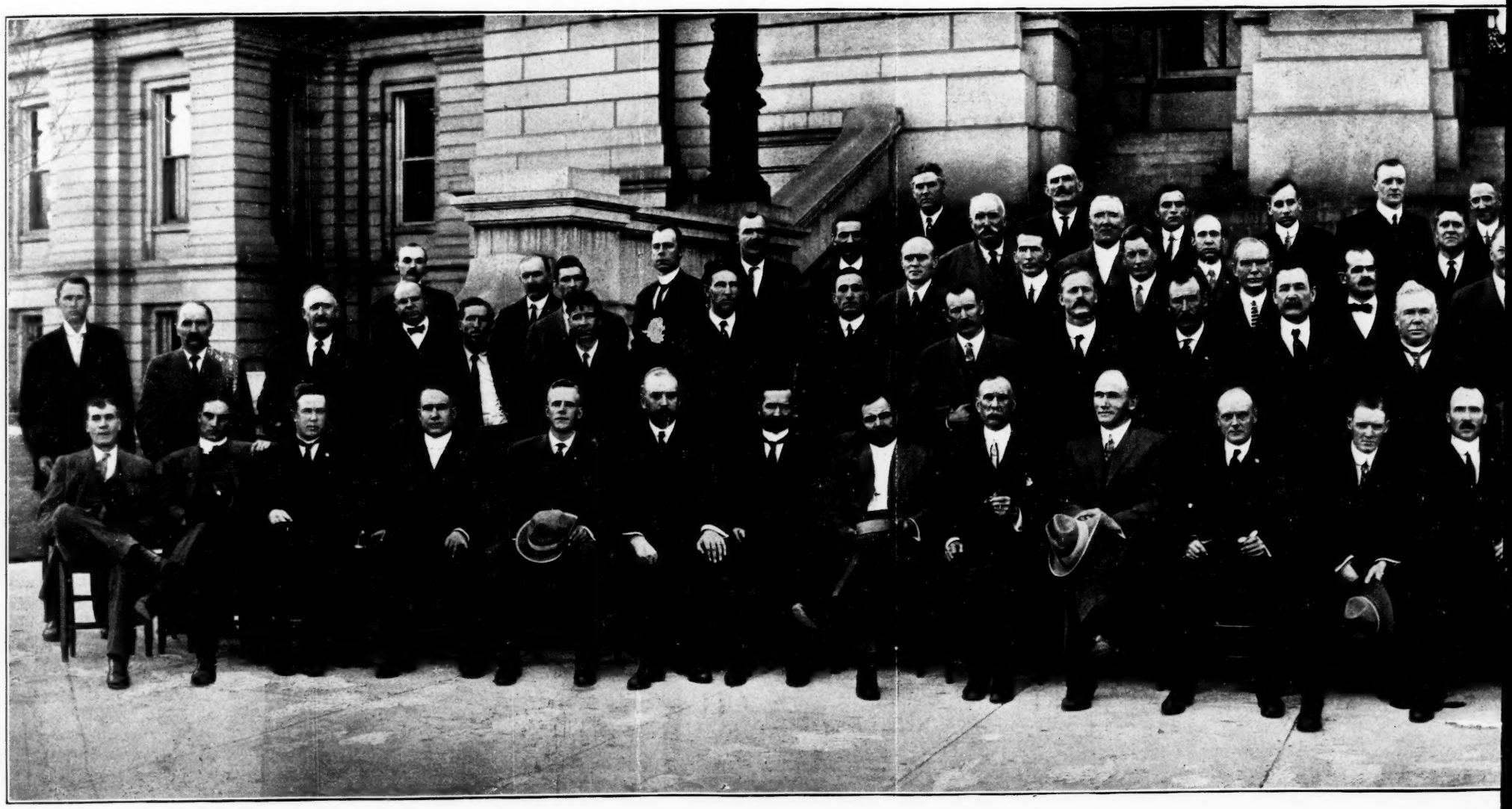
Thompson, George S., General Electrician, Colorado Fuel & Iron Co., Pueblo.
Tenant, H. F., Tolerburg.
Thompson, S. M., Walsenburg.
Tescher, Samuel, Denver.
Thomas, J. P., Cañon City.
Tyson, W. J., Ideal.
Ullrich, E. J., Pres., El Paso County Land & Fuel Co., Colorado Springs.
Visich, P., Ideal.
Van Mater, H., Pres., National Fuel Co., Denver.
Watson, Jos., Louisville.
White, George, Supt., Russell Gates Mining Co., Louisville.
Whiteside, Frederick W., Chief Engr., Victor-American Fuel Co., Denver.
White, C. C., Mining Engineer, Calumet Fuel Co., Perins.
West, Wm., Mine Foreman, Victor-American Fuel Co., Delagua.
Weitzel, E. H., Mgr., Fuel Dept., Colorado Fuel & Iron Co., Pueblo.
Welborn, J. F., President, Colorado Fuel & Iron Co., Denver.
Wallace, Robert, M. C. Leyden Coal Co., 3133 Irving St., Denver.
Wilson, James, Supt., Colorado Fuel & Iron Co., Starkville.
Wheeler, W. H., Berwind.
Williams, Jake, Louisville.
Zook, Ira D., Supt., Rocky Mountain Fuel Co., Majestic.

NEW MEXICO

Breen, Henry, Miner, St. L. R. M. & P. Co., Sugarite.
Enright, W. C., Chief Engineer, Victor-American Fuel Co., Gibson.
French, Allan, Gen. Supt., St. L. R. M. & P. Co., Raton.
French, Archie P., Mine Foreman, St. Louis, Rocky Mountain & Pacific Co., Van Houten.
Forman, Sebastian, Fire Boss, Stag Canon Fuel Co., Dawson.
Husband, Tom, Mine Foreman, Victor-American Fuel Co., Gibson.
Hart, John, Carthage.
Harvey, Thos C., Mine Inspector, St. L. R. M. & P. Co., Koehler.
Jennings, John, Superintendent, Barlett Mine, Victor-American Fuel Co., Gibson.



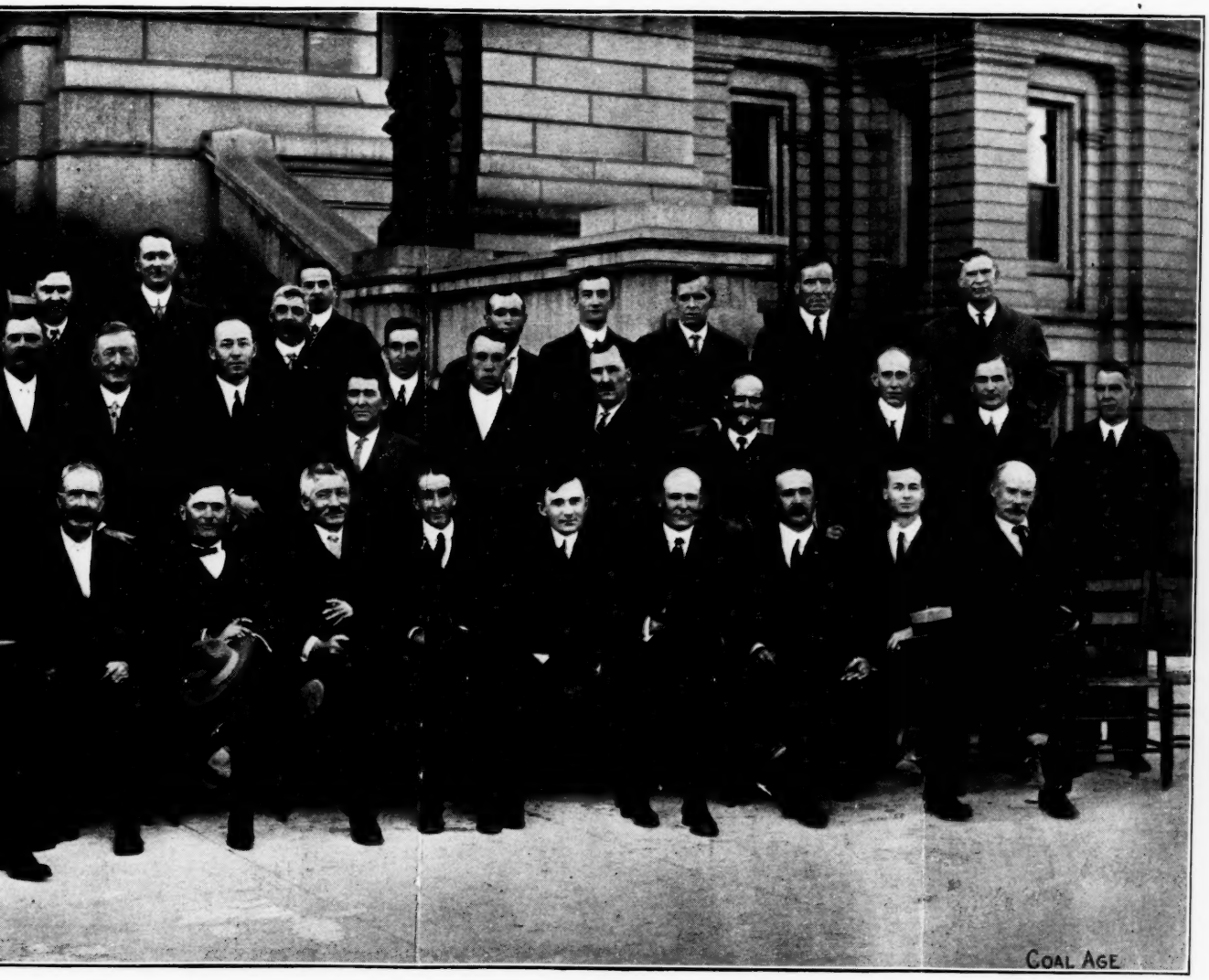
Supplement to Coal Age, Nov. 30, 1912

First Convention of the Rocky

Held at Denver, Colo.,

First Convention of the Rocky Mountain Coal Mining Institute

Held at Denver, Colo., Nov. 12 and 13, 1912



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Kerr, Walter, Supt., St. L. R. M. & P. Co., Koehler.
Morrow, J. D., Coke Oven Supt., Stag Cañon Fuel Co., Dawson.
Morris, J. W., Night Foreman, St. L. R. M. & P. Co., Koehler.
O'Brien, T. H., Gen. Mgr., Stag Cañon Fuel Co., Dawson.
Risdon, W. W., Supt., Albuquerque & Cerrillos Coal Co., Madrid.
Stafford, Frank, Foreman, Stag Cañon Fuel Co., Dawson.
Smith, Joe, Gen. Supt., Stag Cañon Fuel Co., Dawson.
Smigelow, W. C., Supt., St. L., R. M. & P. Co., Gardiner.
Saul, Moses, Fire Boss, Stag Cañon Fuel Co., Dawson.
Somerville, D. H., Gen. Supt., Victor-American Fuel Co., Gibson.
Thomas, Edmund, Mine Inspector, Stag Cañon Fuel Co., Dawson.
Weitzel, F. R., Dawson.

UTAH

Bailey, A. L., Supt., Sunnyside Mine, Utah Fuel Co., Sunnyside.
Cameron, Frank, Gen. Mgr., Castle Valley Coal Co., Salt Lake City.
Cowie, A. H., Vice-Pres., Utah Fuel Co., Salt Lake City.
Elliott, W. R., Mgr., Utah Engineering & Machine Co., Salt Lake City.
Elwood, W. J., Mine Inspt., Utah Fuel Co., Price.
Forrester, J. Bryce, Geologist, Utah Coal Mines Co., Salt Lake City.
Gibbs, C. H., Geologist, Utah Fuel Co., Salt Lake City.
Gilbert, A., Supt., Utah Fuel Co., Clear Creek.
Herres, Otto, Jr., Asst. Engineer, Utah Fuel Co., Castle Gate.
Jones, W. W., Chief Engr., Blackhawk Coal Co., Hiawatha.
Kirkpatrick, R. R., Supt., Coke Ovens, Utah Fuel Co., Sunnyside.
Lewis, H. E., Supt., Consolidated Fuel Co., Hiawatha.
Lewis, T. J., Coalville.
Littlejohn, Wm., General Inspector, Utah Fuel Co., Castle Gate.
Marchant, H. C., Sales Manager, Wyoming Coal Co., Ogden.
McKirken, Robert Addison, New Harmony.
Ostlund, E., Mine Supt., Utah Fuel Co.
Pettit, J. E., State Coal Mine Inspector, Salt Lake City.
Parmley, T. J., Supt., Utah Fuel Co., Winter Quarters.
Russel, J. P., Asst. Engr., Utah Fuel Co., Salt Lake City.
Rockhold, C. K., Mine Foreman, Utah Fuel Co., Sunnyside.
Wetzel, W. N., Utah Fuel Co., Castle Gate.
Watts, A. C., Chief Engineer, Utah Fuel Co., Salt Lake City.
Williams, H. G., Gen. Manager, Utah Fuel Co., Salt Lake City.
Williams, W. B., Gen. Superintendent, Utah Fuel Co., Salt Lake City.

WYOMING

Harrington, D., Gen. Manager, Big Horn Collieries Co., Crosby.
Harris, Walter F., Supt., United States Coal Co., Kemmerer.
Hallet, Wm. J., Chief Engr., Union Pacific Coal Co., Rock Springs.
Irving, Will, Asst. Foreman, Proposia Coal Co., Hudson.
Knox, W. C., Mining Engr., Kemmerer Coal Co., Frontier.
Knox, Glen H., Mining Engr., Kemmerer Coal Co., Susie.
Martin, J. A., Contractor, Superior Coal Co., Superior.
McArty, F. L., Supt., Superior Coal Co., Superior.
Prentice, Dan, Miner, Diamond Coal Co., Diamondville.
Pryde, George B., Asst. Gen. Supt., Union Pacific Coal Co., Rock Springs.
Quealy, P. J., Vice-Pres. & Mgr., Kemmerer Coal Co., Kemmerer.
Sampson, J. M., Foreman, Superior Coal Co., Superior.
Woodson, E. F., Mining Engineer, Central Coal & Coke Co., Rock Springs.

OTHER STATES

Campbell, H. C., Central Coal & Coke Co., Kansas City, Mo.
Delamater, G. R., Pennsylvania Crusher Co., Philadelphia, Penn.
Manley, Frank A., Vice-Pres. and Gen. Mgr., Union Pacific Coal Co., Omaha, Neb.
Parsons, Floyd W., Editor, "Coal Age," 505 Pearl St., New York City, N. Y.

Needed Education in Coal Mining

By David Griffiths*

In the plain, unvarnished language of an experienced coal operator, Mr. Griffiths urges the great need of education in practical and scientific mining among the men directly engaged, newspaper representatives, and state officials.

Particular emphasis is placed upon the importance of "a square deal" from the public press.

*Superintendent, Colorado Fuel & Iron Co., Nonac Mine, Cañon City, Colo.

I am not an orator and have never said a word in public during my 30 years' experience in the coal mines of Colorado, but being requested to speak by our worthy chairman, and as I am deeply interested in the future welfare of this organization, I will make an effort to say a few words in behalf of the Western Mining Institute, which we are about to organize.

As I understand it, it is the object and intent of this organization not merely to assemble occasionally for the purpose of discussing various problems in coal mining and to thus obtain the best possible results in economic operations, but its especial duty will be to devise ways and means whereby accidents in coal mines will be minimized. Figuratively speaking, we are about to plant a tree in the State House of Colorado and desire its roots and branches to extend over Wyoming on the north, New Mexico on the south and Utah on the west. So we expect this tree to bear fruit over a vast area. We must remember that the planting of a tree even in good soil is useless unless we cultivate, prune and nurture its development. If we will not do so, the tree will not bear the desired fruit. So in order to make the Western Institute a success, we must not only start it off in good shape, but we must keep on adding to its strength in various ways, so that it will become a known factor and a recognized power over this broad territory.

In other coal-mining states and countries of the world, much has been accomplished through similar organizations to reduce loss of life among men engaged in the production of coal, and there is no reason why our institute in the west should not be equally useful and attain the same results.

There are many ways by which this organization can be made beneficial to the men engaged, in various capacities, that are handling the "dusky diamond." I will endeavor to confine my brief remarks to the necessity of a crusade of an educational nature among three classes of men that are directly and indirectly connected with coal mines.

First: We need to educate ourselves. It is amazing how few of our number, holding positions of trust, and having charge of men in and around coal mines, are conversant with our brief mining laws and cognizant of our duties in enforcing them. Going down the line to our company men and miners, I think I can safely say that not over 5 per cent. of them are in any way familiar with the statutes that have been enacted for their especial benefit and protection. This condition I think can, and ought to be remedied, and if thoroughly done its effect in reducing loss of life will soon become apparent.

Now to reach the officers or men in charge I consider an easy matter, which could be accomplished in this manner: Have our general managers or owners of coal properties issue a circular, compelling every superintendent, pitboss, fireboss or other officer having charge of men send them a copy of the mining law in their own handwriting every six months.

But to come to the masses engaged in coal mining, to get these men of various nationalities educated in the mining law will be a difficult task indeed, but I think I have an original scheme that is practical, and which, if put in operation,

would work wonders in educating our company men and miners. This plan is as follows: Have every school in every coal-mining district devote one-half hour on Friday afternoon after school hours to the familiarizing of all male pupils between the ages of 12 and 16 years with the contents of our laws governing coal mines. At the end of each term of school, award small prizes, say $5, $3 and $2, to those that are best posted, the principal of the school to be the sole adjudicator.

Now, someone may say that this is causing extra work to our teachers with no compensation. In this respect, I will vouch that 95 per cent. of our teachers will do this work gratis, providing we can show them the benefit of the system. If we go a step further, and put an incentive before our teachers, probably it would be a good scheme to award a prize, say $20 or more, for the best set of practical amendments to our mining laws compiled by any school and its teachers, judges of the amendment to be members of this institute and appointed by the president.

There is no denying the fact that we need to be educated and that we should adopt some system that will encourage a knowledge of practical and scientific mining among our present forces and the rising generation.

Newspaper Men Need Educating

Second: Our reporters and press agents need to be educated. Generally speaking, these men are the best informed people in the community in which they reside, but as a rule their knowledge in connection with coal mining is very limited, and it seems that there is nothing too bad for them to say about coal operators and their officials. Especially is this true when we have our sad disasters, causing heavy loss of life. How often do we see in glaring headlines in our newspapers something like the following:

"Fifty Miners Sacrificed on the Altar of Corporate Greed."

"Twenty-seven Miners Lost Owing to Negligence of Mine Officers."

"Terriffic Explosion of Blackdamp—15 Miners Cremated," etc.

I think that such bitter criticism is unjust, unfair and unwarranted. Corporate interests controlling coal miners are just as humane as other corporate interests controlling other industries. Our mine officials are just as vigilant and intelligent as other officials, our coal-mine inspection is just as efficient, and I am sure that blackdamp will not explode.

Now I claim that this bitter criticism and false representation of the facts is a factor to be considered and that it has its bearing on the list of fatalities in our coal mines.

I will answer before I am asked, how does this affect accidents and loss of life?

Our newspapers and press dispatches are circulated to all corners of the civized world, and their contents read by millions in every walk of life. Under the glaring headlines aforementioned, our coal mines are represented to be as bad as Dante's Inferno, and the officials in charge are termed culprits and criminals of the worst type. The result of all this is obvious. Our reliable, experienced miners leave the camp and go elsewhere to places that they do not consider so hazardous, and experienced men from other localities steer clear of mines so blackly pictured in the columns of the newspapers.

Now what happens? The consumer demands our product, and in our necessity we must hire everything that comes along, be it Jap or Greek. Some of these people never saw a coal mine before, and we have to train them into the business. During this training period there must necessarily be more accidents and casualties than would be the case if they were experienced miners.

I think that I have made the point clear. False representation of the facts by press agents is indirectly contributory to our list of fatalities.

Now, gentlemen of the press, we do not court any favors, neither do we fear just criticism, but we do want you to give us a fair, square deal. If, at any time, we are guilty of culpable negligence, which has caused the loss of life among our fellow workers, we deserve the full penalty of the law, the most severe criticism of the press, and there is no paint too black with which to besmirch our reputation. Personally I do not consider the law of Moses, "an eye for an eye and a tooth for a tooth," too severe. On the other hand, if we are doing all we possibly can to avoid accidents, give us the credit that is our just due.

I don't think that reporters and press agents publish many things with any evil intent. But I do say that their source of information is ofttimes irresponsible and unreliable. May I suggest that you seek your information, relating to coal mines, among coal-mine officials and intelligent miners. If you do so, I can assure you better results, and after a fair trial and rigid investigation, you will admit, in a short time, that you have found some good in the house of Jeroboam. We do not want your ill will, we court your assistance, and trust that our united efforts will end in reducing loss of life and limb in our coal mines.

Don't forget the good motto, in the well known "Old Bear" story, "If you don't boost, don't knock."

Third: Our executive and legislative bodies need to be educated. Very few of our executive officers and legislators give the coal-mining industry of this state the consideration it deserves, and have no idea how important it is for this industry to be in flourishing condition. The quantity and quality of coal produced and consumed in any state or country is a safe and accurate barometer of its wealth and progress.

It is the enormous production and consumption of coal that has elevated Uncle Sam to his enviable position among the nations. The same thing has rendered Great Britain the mightiest naval and maritime power on the face of the globe, and has made the German Empire England's sharpest competitor in steel and finished products.

It is the production and consumption of coal that has made Belgium the bee-hive of industry on the continent of Europe, and the Empire of Japan the greatest naval power and progressive nation among the Orientals.

Abundance of Coal in Colorado

It is the abundance of this commodity that has made Colorado one of the wealthiest states in the Union. If we did not have the "dusky diamond" it is safe to assume that Denver, the "Queen City of the Plains," would not be so flourishing, neither would we be sitting today in one of the most magnificent structures of modern times. It is the abundance of coal of the desired quality that has made Pueblo the greatest steel and ore-smelting center between the Mississippi Valley and the Pacific Ocean.

Much can be said in favor of "Old King Coal," in its adaptation to the economic treatment of low-grade ores; its intrinsic worth as an export commodity, and the tribute we receive through it from our neighboring states; its value as a source of revenue to our transportation companies; its power as a distributor of wealth among the masses of men not directly engaged in its production, and the relation it bears to agriculture in refining sugar, etc.

Let us briefly review our coal-mining history and the law governing coal production. In the early '80's there were less than 1000 men engaged in the industry and our annual output was less than one million tons. In 1883, there was a brief mining law enacted that can be well termed an inspection law. The same law with a few minor amendments is still on the statutes. In the ensuing period of about 30 years, conditions have greatly changed, and the law as it now stands is inadequate to cope with present necessities. Our production has increased to over 12 million tons, and I predict that in 1920, it will be over 20 million tons. The number of men engaged is now about 14 thousand.

I think it is time, therefore, for our executive officers and legislators to awaken to a sense of duty and give us a clear, explicit, practical mining law that will not hamper or impede the industry, but will define the duty of every man connected with coal mining from the greaser to the owner, with a main motive

in view of protecting the life and limb of our workmen, so that the rescue car and the first-aid team will have very little exercise.

The national government has given us a Bureau of Mines, which also serves as a commission of research. This bureau has stimulated the first-aid movement and allotted us a rescue car for the Rocky Mountain region. I trust that the members of the Rocky Mountain Coal Mining Institute will work hand in hand with it in the humane work of reducing the number of fatalities in mines.

Personally and in behalf of the members of this assembly, I will say that we would much prefer rather than have our last resting place marked with polished granite slab or marble monument, to have it said by the rising generation that this organization was instrumental in reducing loss of life in our coal mines.

A Method of Humidifying Mine Air

B. J. Matteson, assistant manager of the Colorado Fuel & Iron Co.,* in his remarks before the Rocky Mountain Coal Mining Institute, gave the following description of a method of humidifying mine air which has been used with marked success in the mines of his company.

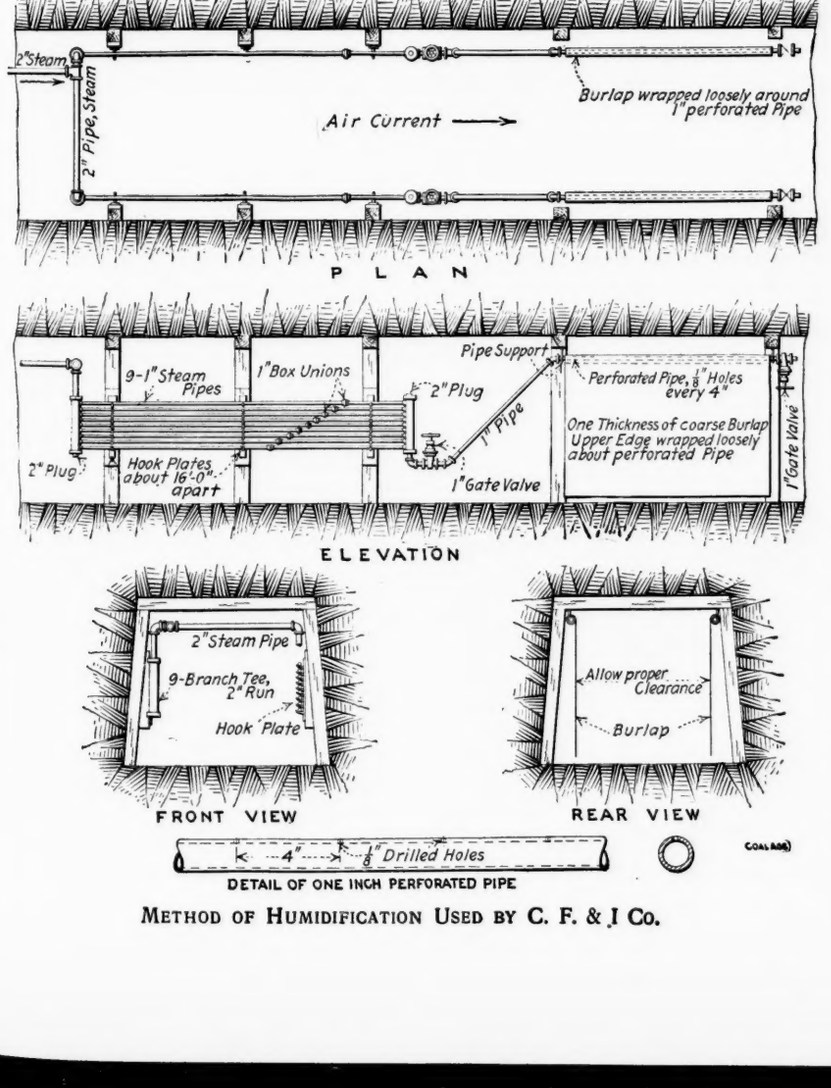
"A radiator is placed on both sides of a heading through which the entering air passes. Its construction is clearly shown by the accompanying drawing. Live steam is passed through it and the waste steam which is discharged is conducted to a perforated pipe through the 1-in. gate valve shown on the drawing.

"Attached to this perforated pipe is a curtain of burlap or brattice cloth, the purpose of which is to bring the moisture or condensed steam in contact with the air current. As the air passes over the radiator it is heated and its capacity to pick up moisture correspondingly increased.

"It then passes over the saturated curtains and its humidity is raised to the dew point. The air usually reaches the inby end of the cloth screen at a temperature of approximately 70 deg. F., and as the air current passes through the mine, a deposit of moisture is secured by the lowering of the temperature of the air to that of the mine.

"The operation of the radiators has been very successful and has enabled us to keep all parts of the workings in a moist condition. In Colorado, the relative humidity of the atmosphere in the winter time does not average above 15 per cent. and much water must be furnished the air or it will dry up the mine in its passage.

*Fuel Department, Pueblo, Colo.



METHOD OF HUMIDIFICATION USED BY C. F. & I CO.

Indestructible Signs and Signals

Every wide-awake and thoroughly up-todate mine manager and superintendent is keenly alive to the advantages of having all signs and signals, in or about a mine, both above and below ground, at all times thoroughly legible. Realizing this fact, the Stonehouse Enameled Steel Mine Signal Co. has recently developed and placed upon the market a type of sign board which appears to be in a class by itself.

Heretofore, the custom has been to print or paint mine signs or signals upon paper, cloth or board, which may be placed in the desired position. This method is entirely satisfactory for places above ground which are not subjected to extreme dampness or the action of the elements. Underground, however, the conditions are such as to render signs of this character, not only unsatisfactory, but expensive.

The sign boards made by the above named company are enameled sheet steel. They are, therefore, light and convenient to place, and at the same time are the most durable that it is possible to make, as they are absolutely unaffected by mine water, whether aciduous or otherwise.

Enameled Danger Signals

Modern mines are not only copiously furnished with numbers marking the different entries or rooms, but in many cases various signs are used, denoting danger from bad roof or from electrical conductors. Where large numbers of workmen of different nationalities are employed, it is well to have these signs of such a character that anyone, regardless of race or education, may readily understand them. Bad roof may be well denoted by a skull and crossbones, while dangerous electrical conductors can be marked by a hand clenching the thunderbolts. In order to save time, also, particularly in the case of accident, it is advisable at frequent intervals, to post a hand with the index finger pointing the way to the main road, the shaft bottom, or the drift mouth.

Many of these wordless danger signals are tedious and expensive for the management to make upon their own premises, to say nothing of the expense incurred from their necessarily frequent renewals. The advent upon the market, therefore, of a sign or class of signs which are at all times legible and thoroughly indestructible should be heartily welcomed by coal-mining men.

Prevention of Coal Dust Explosions

By Samuel Dean*

The disaster at Hastings showed quite plainly that an explosion could propagate over the wet portion of a mine, for it is certain that gas alone was not responsible for its extension. The cessation of its violence was due to excessive expansion and not to the presence of water. The Victor-American Fuel Company is making its mines safe by the use of adobe dust, which is distributed through the workings pneumatically. This dust is not of a harmful character and has a high degree of solubility.

*Inspector of Mines, The Victor-American Fuel Co., Delagua, Colo.

In Section 18 of the Colorado Coal Mine Regulations it is required that in all coal mines known to generate explosive gas, the owner or agent shall provide and adopt a system by which water under pressure or otherwise shall be sprinkled, so as to make damp all accumulations of fine coal dust which may accumulate from time to time on any haulage road, room, stope or other working place.

As there is often a scarcity of water in the vicinity of the mines of the Rocky Mountain region, it would seem that the law, when revised, should be carefully considered in regard to this particular provision, for where stone dust is distributed through a mine in such manner that small coal or coal dust becomes thickly mixed with the stone dust, the action of that mixture cannot be regarded as acting in any way as would coal dust in its natural condition.

An Explosion in a Wet Mine

At Hastings, Colo.,[1] where a coking coal is worked, an explosion occurred last June, and at this mine there was no shortage of water whatever. The explosion traveled through workings which were naturally damp and which were being driven to the dip. A stream of water flows down the back slope or intake airway, and water drips from the roof in places in the main slope or haulage way, which is also the return for the air.

All indications show that a quantity of gas near the face of a heading off the third south, was ignited by a defective Wolf lamp in the hands of a fireboss. About five-eighths of an inch of the gasket on the top of the glass was found bent over, and the lamp ignited the explosive mixtures on the surface during tests which were made after the explosion.

[1]For a map of the area surrounding Hastings see Coal Age, Vol. I, p. 635, and for a plan of the mine workings see Vol. II, p. 6.—Editor.

The condition of the body of a miner found in the third north heading about 650 ft. from the point of origin gave valuable information. This man was evidently standing with his back to the face of the north heading when he was met by the blast. From head to foot his body was punctured with small coal.

The Pioneering Cloud was Full of Large Pieces of Coal

In the pioneering cloud of the explosion, there was more than dust present, for the unfortunate man had been struck in the chest by a piece of coal, or rock, which left a deep wound 4 in. in diameter, and there were other wounds measuring from 1 in. across down to the size of a pinhead. His hair, also, was singed.

It was not the flame which struck him first, otherwise he would not have been standing erect, facing the onrushing small coal. The flame and the "cloud" may have been traveling together, but it is a reasonable conclusion that the flame obtained its fuel from the cloud of damp dust and coal, assisted by a small percentage of methane in the blast of air.

In that manner the explosion was propagated up the slope. Above the outward end of the rock tunnel from seam "A" to that known as "B," that is for over half a mile from the point of origin, beads of coke were found adhering to the outside faces of the props. Coke was also found in other places nearer the point where the explosion originated.

An Unprejudiced View

It is important that all bias be removed when considering this explosion. The first state inspector to enter the workings after the disaster declared that the explosion had traveled through a *wet mine*. Pools of water lay in the cross entries driven north and south.

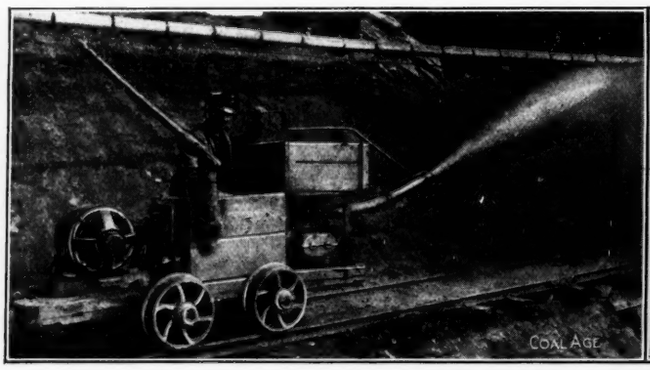
Water was loaded with the coal at some of the faces and dripped from the cars as they were hauled up the slope. The wet- and dry-bulb readings taken before the explosion in all parts of the mine showed relative humidities which varied from 92 to 97 per cent. with an average temperature of 60 deg. F.

Yet some parts of the mine which were not touched by water, but only came in contact with the humidified air, would not be considered sufficiently wet by the critical observer. And it was possible to pick up handfuls of comparatively dry fine coal in places where it had fallen from the end-gate cars and had been crushed by the traffic.

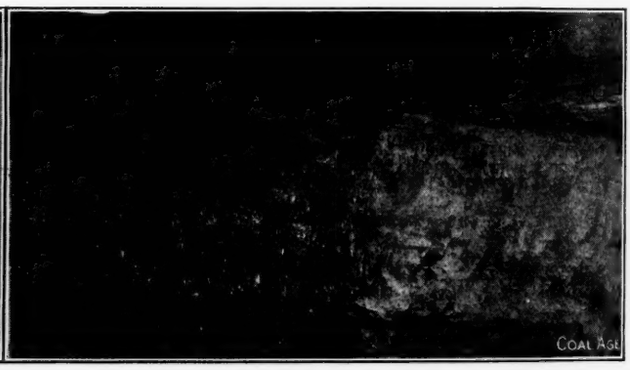
But it is doubtful, *and this statement is most important*, whether it is possible to maintain constantly, by artificial means, in naturally dry workings, the damp condition which is general in all parts of this mine during the summer months. And it should not be forgotten that this explosion occurred in the summer time.

Gas Alone Not Responsible

The origin or cause of the explosion was gas, but any suggestion that it alone



The Electro-pneumatic Stone-dust Machine with the "Father" of the Rocky Mountain Coal Mining Institute, W. F. Murray, "in the Saddle"



The Right-hand Half of the Rib Has Been Dusted with Adobe Dust, While the Left-hand Half Has Not Been so Treated. Evidently the Dust "Stays Put"

was responsible for the propagation of the flame for a distance of over half a mile will not bear investigation and can be dismissed.

Before the accident, the quantity of air entering the back slope was 20,000 cu.ft. per min., and the amount of methane traveling with the return air up the main slope has never been found to be as much as 1 per cent. of the mixture; $\frac{3}{16}$ and ½ of 1 per cent. have been found, but no more. The explosion occurred about 9:30 p.m. on June 18 last, and the following are barometric readings taken on the dates, and at the times stated:

TABLE SHOWING THAT THE BAROMETER WAS HIGH AT TIME OF EXPLOSION

Date	Time	Reading
June 14	7 a.m.	23.57
June 15	7 a.m.	23.50
June 16	7 a.m.	23.70
June 17	7 a.m.	23.87
June 18	7 a.m.	23.80
June 18	9 p.m.	23.88
June 19	7 a.m.	23.88

The Hastings mine is located in the eastern foothills of the Rocky Mountains at an altitude of 6450 ft. above sea level. The maximum and minimum barometer readings recorded are, respectively, 23.99 and 23.00. It will be observed that the explosion occurred when there was a high and rising barometer.

Why the Explosion Stopped

Where the rock tunnel enters the upper, or "A" seam, the height from the rail to the roof is 20 ft. But as the slope reaches the level of that bed, the height decreases and in 200 ft. it has tapered down till the measurement from rail to roof is that normal for the "A" seam. Wide openings also branch off in three directions at the top of the tunnel and these openings have other branches leading into worked-out areas filled with an atmosphere, which was doubtless deficient in oxygen.

The explosion appeared to have gained its greatest force coming through the tunnel, every timber being swept out, but on expanding in the high and wide places, the pioneering cloud split up, and the flame no longer had that concentrated supply of fuel necessary for propagation.

Thus the pressure was relieved, and the explosion ceased. Had the slope continued with a cross-sectional area similar to that of the tunnel the explosion would no doubt have traveled to the outside with terrific force.

Had microscopic, chemical and distillational examinations been made of small coal and of the dust gathered from the path of the explosion, and had these been compared with like examinations of the uncharred coal from the "B" seam, then a change might have been revealed which would have convinced the most skeptic as to the causes of propagation.

The Stone-dust Remedy

At the Delagua (Colo.) mines, adobe dust has been applied over 8500 lin.ft. of entries. In the event of an ignition of firedamp, or of an explosion starting in any other way, reliance would be placed upon the adobe dust spread on shelves and projections along the entries to prevent the spreading of the flame.

It is not considered possible for an explosion to be propagated by the aid of small coal or coal dust through the entries which are thus dusted. The photographs show the different arrangements of shelves in the fourth and fifth north entries.

These two main headings, with the cross entries off them, ventilated by an exhaust fan, are treated in this manner. The districts tributary to the first, second and third north main entries are still sprinkled with water, so that, at the present day, there is a good opportunity to compare the two methods in use at Delagua.

Up to the present time, adobe dust has not been applied at the face of the working places. Firedamp is seldom found, and then only in small quantities. The coal is undermined and blasted with permissible explosives. Special shotfirers are employed who condemn all shots drilled in the solid, or drilled deeper than the undermining.

The charge limit is 1½ lb. of explosive tamped with adobe. It is seldom that more than 1 lb. of permissible powder is used per shot, but a charge exceeding the limit is sometimes used in rock shots. Then, before the shots are fired, the roof, floor and sides are thickly covered with adobe dust for 100 ft. in either direction.

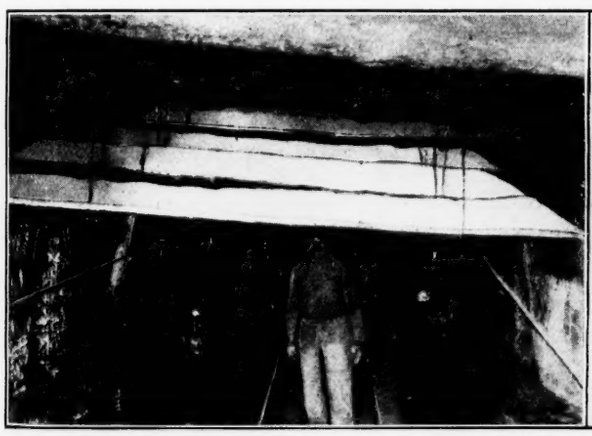
Shotfirers make a daily report, a copy of which accompanies this article. Strict compliance with the rules is enforced. Under these circumstances, it has not so far been considered necessary to apply inert dust at the face.

Clean Roads

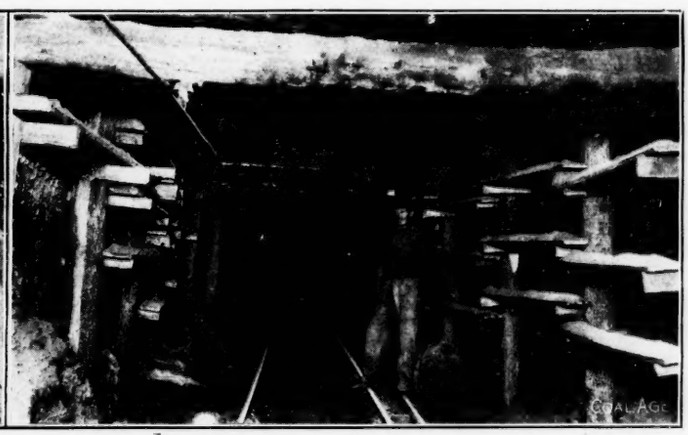
Every effort is made to maintain the principal roads clean and free from accumulations of small coal and coal dust, but success in this direction is not always attained on account of the quantity of coal which falls from the cars, which have end-gates, and because of the difficulty in procuring regular labor to load out the piles of small coal at night.

The two men who erect shelves and distribute adobe during the day time, scrape up the small coal which accumulates between the rails and leave it in piles along the side of the road. These piles are not considered dangerous because they contain a high percentage of adobe, and because of the heavy supplies of adobe dust on the shelves, but they are removed whenever men are available for the work.

Occasionally water has been sprinkled between the rails where the roof and sides are covered with adobe dust. In the cross entries reliance is placed on the adobe on the shelves, and on that which has been thrown onto the roof and sides by hand, also on the coarse adobe



ADOBE DUST ON HANGING SHELVES ABOVE THE ROADWAY WHERE HEIGHT PERMITS



SHELVES ARE STRUNG ALONG THE ROADWAY HEAVILY LOADED WITH DUST

which has been scattered over the floor and mostly reduced to dust by the traffic. Small coal and dirt in cross entries is not removed except when it impedes the traffic.

Distributing Stone Dust by Machine

About three times per month, all surfaces of the fourth and fifth north haulage roads, and the slope, are given a covering or coating of adobe dust which is applied by machine. This dust distributor is composed of a small Roots blower belt-driven from a 3-hp. direct-current motor taking current through a trolley pole, the whole being carried on a truck.

The quantity of dust which the machine will blow or distribute is 100 lb. in 12 min. The finer particles of dust propelled from the blower will travel, still suspended in the air, a distance of over 2000 ft., when the air current is traveling at a speed of 300 ft. per min. The mechanical dust-distributing train consists of a locomotive, a mine car containing dust in sacks, and the machine.

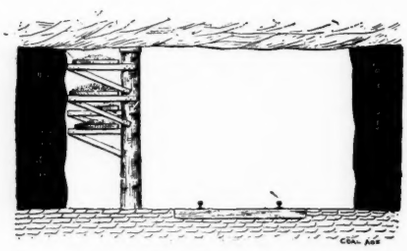
Two men are employed, one on the locomotive, and the other feeding the machine and handling the hose. The train seldom stops, but proceeds at a slow pace with the man at the hose spraying the heading from side to side and on the roof. In this way, over two miles of entries can be covered in a night. It is interesting to notice that after treatment of this kind, entries driven through solid coal resemble rock tunnels.

The Taffanel Barrier Boards are Fireproofed

In addition to dust placed on shelves, all ledges, holes and natural projections along the entries are cleared of coal dust, and filled by hand with pulverized adobe, so that such places can never again become resting places for dangerous quantities of fine coal dust. The upper sides of all roof timbers are covered with adobe dust. All shelves which have been erected recently are practically fireproof, being covered on the underside with thin sheet iron.

Is Stone Dust a Menace to Health?

The thought has been expressed that large quantities of stone dust in mines, may cause pulmonary troubles. Where adobe dust is used, no trouble of this kind has developed, nor have the workmen in the mine suffered any discomfort.



Shelves on One Side of Entry and Back of Post Row

But undoubtedly the adobe in the vicinity of Delagua is not of such a clayey nature as that found further South, and in parts of New Mexico. It has been decided, however, to install a mill for the purpose of reducing suitable shales to dust for use in the mines at a future date.

Through the kindness of W. E. Garforth, the Delagua adobe has been microscopically examined by H. Crowther, who has compared the Delagua dust with that at Altofts, made from clay bind, or argillaceous shale. This was chosen for comparison, as J. S. Haldane, the eminent physiologist, has reported favorably on its use from an hygienic standpoint. (See report of Mining Association of Great Britain, page 120.)

The dust used at Altofts colliery for stopping coal-dust explosions is from soft shale, and is certainly not of such a nature as to give rise to any anxiety as to the effects produced by inhaling it, particularly as the amount inhaled would be small. . . . It would be well to point out, however, that dust from hard stone, fireclay, sand or any material containing free silica ought not to be employed.

Below are appended the specific gravities, and the solubilities in several fluids of the two kinds of dust.

Altofts Shale Dust Gravity	Percentage of magnetic particles	Solubility in		
		Distilled Water	Dilute hydrochloric acid	A digestive fluid
2.65	2.70	2.186	6.886	2.557
Adobe Dust 2.77	0.50	4.586	9.336	4.591

It will be seen that the adobe has a high ratio of solubility and were this point alone considered, the dust would be most suitable for dusting a mine.

The microscope shows that it contains two kinds of siliceous particles, one consists of flakes of clay and the other of rounded grains of quartz with few cutting edges. The former are composed of silicate of alumina, which contains also traces of mica, limestone and oxides of iron.

The free silica is chalcedony, an amorphous form of quartz. The chalcedonic particles are more or less rounded and proportionately few are pointed or cutting. The material has been subjected in the past to attrition under water, hence many of the particles are smooth. It is inert and contains no substance which would give off any injurious gases or fumes.

The free silica in adobe is in less irritating form, except as regards insolubility, than in any of the siliceous materials hitherto examined. At a later date, I will deal with the matter of inert dusts suitable for use in mines. This article will be illustrated with drawings magnified 85 diameters, and drawn under polarized light.

The Root of the Evil

The wooden end-gate is the chief cause of the presence of coal dust on all mine roads. The small coal which falls through the bottom, sides, and ends of the cars is quickly reduced to powder by the traffic. The removal of all dust is impossible, but with the introduction of dust-proof cars, and rotary dumps, the application of the stone-dust remedy can be made more effectual, for the amount of dangerous dust to be diluted or rendered harmless is trifling compared with the quantity always in evidence where the end-gate car is in use.

THE VICTOR-AMERICAN FUEL COMPANY

Delagua Mine, ...19....

SHOTFIRER'S DAILY REPORT

District of mine.....

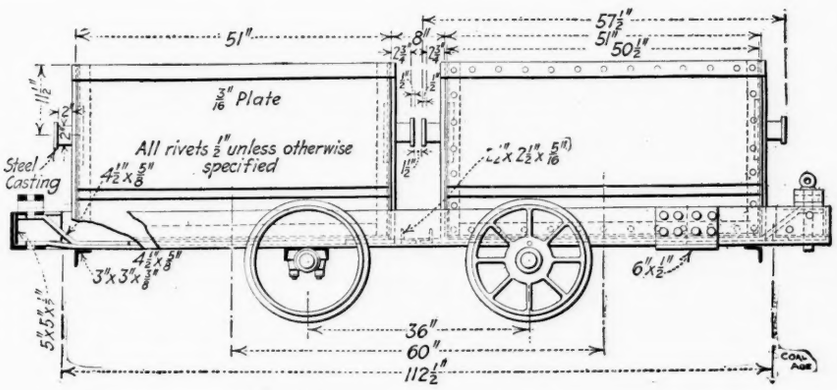
Time first shot fired?..... Time last shot fired?.....
Number shots examined?..... Number tamped?..... *Number Fired?.....
Number of shots condemned, reason why, and where located?.....
.....
.....
Did you fire any shots on Main Haulage roads back from the face?.....
Number of missed shots, where located.....
.....
.....
Number of blown out shots, where located, and cause of blow out?.....
.....
Did you use a wooden tamping bar for tamping all charges?.....
Did you find anyone in the mine during the time you were firing shots?.....
.....
Did you find any miners with detonators in their possession?.....
Did you examine all the places again, with the aid of a safety lamp, after you had fired the shots, and leave your initials in chalk on the face where the coal had been shot down?.....
Did you fence off all missed shots?.....
Is your safety lamp clean, and in good condition?.....
Did you find any gas in the working places?.....
State the correct time at which you left the entrance to the mine?.....
State here any further remarks you wish to make.....
.....
.....Shotfirer

*As none but permissible powders are now used, it is no longer necessary to state the number of shots containing black powder, dynamite or permissible powder as was formerly the rule.—[Editor].

Combined Mine and Bucket Car

BY BENEDICT SHUBART

The Spring Canyon Coal Co., who are developing near Helper, Utah, and expect to commence operations about the first of the year, are introducing a novelty hitherto untried in the Western field. After careful consideration, in place of constructing a long and crooked surface haulage road, the coal will be taken from the mine opening to the tipple by an aërial tramway.



SIDE VIEW OF COMBINATION CAR

The mine cars consist of a steel truck designed like that of the usual mine car, but the body will be made up of two steel buckets, each holding 3000 lb. of coal, and having trunnions on the ends to receive the yoke of an aërial tram.

The results of this experiment are being watched closely, as its success will permit the opening of large bodies of coal which would otherwise be inaccessible.

Coal Industry of New Mexico.

BY T. H. O'BRIEN

The coal fields of New Mexico are widely scattered over the state and vary in quality from sub-bituminous to anthracite, the latter being of comparatively negligible importance, occupying only limited areas where the coal has been locally metamorphosed by igneous intrusions. The larger part of the bituminous areas are in the northeastern part of the state, in Colfax County, which now produces about 75 per cent. of the total output. This field has only come into prominence in the last 12 years, its earlier development having been retarded owing to the fact that the greater part of it was included in one of the large private land grants. The coal in the remaining fields is mostly sub-bituminous or lignitic. The total available supply of all classes of coal in the state has been estimated at 163,780,000,000 tons, which is equivalent to 5.3 per cent. of the total coal supply of the nation.

While the mining of precious metals was carried on in New Mexico at an earlier date than any other state in the Union, there was not any extensive development of the coal until after the Santa Fé had extended their lines into the territory, when, in 1882, they opened a mine at Blossburg, three miles southwest of Raton, in order to supply fuel for their locomotives. The production of the first year was 157,092 tons, and the accompanying table will show the increase since that time.

It will be noted that while it took 17 years for the output to pass the one million mark, in the five years ending with 1905, the production was 6,779,348, and in the next five years it increased to 13,371,058 tons, a gain of nearly 100 per cent. This increased production was largely due to the further development of the copper properties in Arizona and Mexico, which the Colfax County fields were opened up to supply.

PRODUCTION OF COAL IN NEW MEXICO FROM 1882 TO 1911, INC.

Year	Quantity	Year	Quantity	Year	Quantity	Year	Quantity
1882	157,092	1890	375,777	1898	992,288	1906	1,964,713
1883	211,347	1891	462,328	1899	1,057,714	1907	2,628,959
1884	220,557	1892	661,330	1900	1,299,299	1908	2,467,937
1885	306,202	1893	665,094	1901	1,086,546	1909	2,801,128
1886	271,285	1894	597,196	1902	1,048,763	1910	3,508,321
1887	508,034	1895	720,654	1903	1,541,781	1911	3,378,019
1888	626,665	1896	622,626	1904	1,452,325		
1889	486,943	1897	716,981	1905	1,649,933	Total.....	34,480,837

MARKETS

The coal finds a ready market for steam and domestic purposes in Arizona, New Mexico and Mexico, and in the western parts of Oklahoma, Kansas and Texas. Of late years the domestic business in the eastern territory has been developed so rapidly that the mines in northern New Mexico are operating to full capacity to supply the demand. In all of this territory the coal has to meet the competition of crude oil, which has been, and still is, an important factor in the western district; but in the eastern field coal is now beginning to displace oil, due to the increased price of the latter, and will undoubtedly do so, more and more, every year, unless new oil fields are discovered.

At the present time practically all of the large power plants in the western district are using California oil, and though the supply seems to be inexhaustible, the history of all other oil fields will justify the belief that in the near future the production will begin to decline with the corresponding increase in price, thereby making the use of coal more economical than oil. When that time comes, it is safe to predict a 100 per cent. increase in the coal production of New Mexico, and if the change should come suddenly, the mines would not have the capacity, nor the railroads the equipment, to handle the business.

The Colfax County fields contain the bulk of the coking coals of the state, which has been an important factor in the development of this field, as it gives an outlet for the fine slack necessarily produced in preparing coal for the steam and domestic trade. The following table will show the remarkable increase in the production of coke in tons during the past decade:

COKE PRODUCTION IN NEW MEXICO

Year	Ovens	Production
1882	12	1,000
1890	70	2,050
1900	126	44,774
1906	571	147,747
1907	896	265,125
1908	1016	274,565
1909	1030	373,967
1910	1030	401,646
1911	1030	392,635

This rapid increase in the coke output is also due to the further development of the copper smelters in Mexico and Arizona; it has supplanted Connellsville and foreign coke, which was previously used for smelter purposes, and is now displacing the Eastern cokes in the foundry trade of the Southwest. The coke business has also to meet the competition of crude oil in the copper industry, but at the present time the coal companies have not the capacity to handle any materially increased tonnage.

The coke ovens are all of the beehive type, except at one installation in the northern field, where the ovens have been so modified as to permit using the waste gases under the boilers which furnish power for the operation of the plant.

*General manager, Stag Cañon Fuel Co., Dawson, N. M.

Current Coal Literature

The Best Thought Culled from Contemporary Technical Journals, Domestic and Foreign

The Candlepower of the Safety Lamp

J. S. Haldane and T. L. Llewellyn have recently made experiments to determine the degree to which lamps are dimmed by the presence of impurities in the air. The *Colliery Guardian*, commenting on these tests, says editorially:

"The results show that every diminution of 0.1 per cent. in the oxygen present lowered the illuminating power of a safety lamp, burning a mixture of colza oil and paraffin, by as much as 3.5 per cent. Thus the striking conclusion is reached that with the oxygen reduced to 19.0 per cent., the minimum percentage allowed by the British Coal Mines Act for purposes of ordinary work in the mine, the light would be diminished by 70 per cent., under the conditions of the experiment.

Effect of Moisture on Combustion

"The diminution of oxygen in mine air can take place in several ways. An addition of 1 per cent. of moisture diminishes the true oxygen percentage in pure air by 0.21. Thus, as the percentage of moisture increases, the illuminating power of the lamp diminishes. Apparently the effect of moisture on the light of a safety lamp has not been heretofore investigated experimentally, although its effect upon photometric determinations is known.

"Thus it has been found that for every increase of 1 per cent. in the moisture percentage of the air, the illumination of the standard pentane lamp and also of the Hefner amyl-acetate lamp decreases 6.25 per cent., and the light from a spermaceti candle falls off 5 per cent.

"The effect would probably not be less in the case of an ordinary safety lamp, and certainly the experiments of Haldane and Llewellyn bear this out, since the variation in moisture content in mine air is as much as, and often greater than, was the case in the experimental chamber employed by them.

Carbonic Dioxide Dims Light But Little More Than Nitrogen

"Passing next to the influence of carbon dioxide, the authors call attention to the confusion which has arisen through attributing to this gas the premier rôle in producing dimness of illumination. In their view it is only the variation in true oxygen percentage which really matters, and how this percentage is diminished is of small importance, although it is true that added carbon dioxide does produce rather more effect than added nitrogen.

"The influence of firedamp upon illumination is somewhat complex. The addition of pure methane to an atmosphere at first increases the brightness of the flame, but as this gas is nearly always accompanied by an increased carbon-dioxide percentage, which acts in the opposite direction, it is not possible to state precisely what the total effect of firedamp will be.

The Need for an Electric Lamp Which Will Test for Gas

"It is becoming daily more obvious that the only satisfactory solution of the illumination problem in mines will ultimately prove to be the electric lamp, which is free at least from deterioration arising from atmospheric influences. If ever a means is found whereby the electric lamp can be adapted to the detection and accurate estimation of firedamp, it will be at once established par excellence as the miner's lamp."

An Explosion Due to Shotfiring

Special Correspondence

The Regal Coal Co., of Iowa, had an explosion in its No. 3 mine on Jan. 15, and the report of the mine inspector, R. T. Rhys, dated Jan. 16, but published toward the close of last month, is, in abstract, as follows:

The mine is situated about seven miles north of Albia, in Monroe County. The main shaft of this mine reached the coal last July and is 210 ft. deep. The airshaft is about the same depth and is located 400 ft. almost due north of the main shaft. The seam of coal will average about four and one-half feet in thickness, and that part of it which has been developed, so far, shows a wavy or hilly formation.

Dry But Not Dusty Mine

The last inspection before the explosion was on Dec. 14, 1911. At that time, parts of the mine, here and there, were wet, and the dry places, in my opinion, could not be said to be in any way dusty. But toward the close of December, a period of unusually cold weather set in. This low temperature was still in evidence when the explosion took place.

As a result the wet places in the mine froze up and the workings became dry throughout, except at the bottom of the shaft. While it could not be classed as a dusty mine, yet on account of its dryness, the roadways were sprinkled, the last application of water being Jan. 7, a little over a week before the explosion. Parts of the mine, however, were so cold that the water, soon after it fell, formed into thin flakes of ice, on the floor and sides of the roadways.

Shots Fired in Still Air

Connection between the hoisting and air shafts were made in December. The mine is ventilated for the present by a 10x2½-ft. fan, placed on top of the quarter shaft.* This system was used in sinking and is only a temporary expedient for ventilating the mine. A larger fan, in all probability, will be erected on the top of the air shaft in the near future. At the request of the shotfirers, this second opening was covered with boards, and hence was not used as an air shaft after the cold weather commenced.

This the shotfirers thought would diminish the possibility of an explosion, and thus add to their safety. The day shift had retired at 4:30 p.m., and only the two shotfirers were in the mine at the time of the explosion, which occurred a few minutes before 5 p.m. Both cages were about midway in the shaft, when the explosion took place.

By its violence, the west cage was lifted to the dumproom while the east cage, according to all accounts, was only raised a few feet. The partition between the quarter shaft and the hoisting compartment burst open from the bottom up, for about 60 or 70 ft. As this partition was on the same side as the east cage, its destruction probably accounts for the fact

*A partitioned section of the main shaft frequently used for a stairway or pumpway.—Editor.

that the latter was not lifted like the cage on the west, because the force found vent through the quarter shaft.

No material damage was done to the fan nor its casing, but on account of the partition of the quarter shaft being out, the fan could not be used with advantage immediately after the catastrophe. Eyewitnesses stated that the explosion appeared first at the main shaft, and a second or two later at the planked head of the airway. Before and after the explosion the air shaft acted as a downcast, and down it rescuers were lowered.

They found the shotfirers about an hour and a half after the explosion, both being dead.

System Followed by Shotfirers

The two shotfirers had fired all the shots in the mine that evening, except those in the rooms of the first and second west entries on the north side of the mine. As was their custom, one man took one entry and the other took the one parallel to it.

They fired the entry shots first, and then in retreating order touched off the room shots of their respective entries. As stated, none but the entry shots had been fired in the first and second west headings, and it was easy to see that the explosion had originated in one of these. The last 90 ft. of each of these entries is rising at a grade of about 6 per cent.

Entries Well Beyond Last Completed Crosscut

Both are driven about 15 or 20 ft. beyond the last crosscut, which is only partially completed. The second crosscut from the face is open and of proper area. In the first west entry two holes had been fired.

One was about the center of the entry and was about five feet deep. This hole was drilled at right angles to the face, and was fully three feet beyond what little cutting had been done. It remained as an indisputable evidence that the dangerous practice of drilling holes far into the solid coal beyond the cutting had been followed in this instance.

The second hole in this entry was on the left rib and drilled to a depth of about four feet. It was charged with seven charges of black powder. It was intended to remove by this shot both top and bottom coal, but only the bottom bench blew out. According to the testimonies of the men working in this entry, these shots were not inspected by the shot-examiner. They informed him that they had prepared two shots, and the understanding was that he was to fire the center hole first, which was charged with dynamite.

In the second west entry only one shot was fired. This was on the right rib, and was about five feet deep. It was claimed that only dynamite was used for charging in this case. This hole was also drilled practically at right angles to the face and was 2 ft. 3 in. in the solid coal beyond the cut.

Still Air Theory Is Wrong

The following are my reflections relative to the explosions:

First. It was an error to close up the top of the air shaft during firing time.

Second. It was wrong, when the shots were being fired, to allow the cages to remain in such a position that they blocked the upcast.

Third. I also believe that these unfortunate men erred in the manner of firing shots. The simultaneous firing of entries in pairs is evidently not a safe method and should not be practiced. Ample time should always be taken when firing shots, but this is especially essential in the winter season, and in new mines such as this.

Dynamite Is Not a Safe Explosive

Fourth. It was an error also to think that holes charged with dynamite would not cause an explosion. This belief existed among some of the men in this mine, as the testimonies in the coroner's inquest indicated. I have found that men in a number of other mines throughout this district hold this same erroneous belief. I do not believe that this explosion can be attributed to a charge of dynamite. But seeing that the center hole in the first west, and the rib hole in the second west entry, were drilled into the solid coal far ahead of the cut, and moreover that both were charged with dynamite, it is not impossible for us to surmise that one or both of these holes caused the explosion.

The belief that dynamite cannot cause an ignition of dust has undoubtedly led men to drill holes far into the solid beyond the cut, and for the same reason shot-examiners have been led to accept the holes as safe. It is true, dynamite is less liable to cause an explosion than ordinary black powder, but it is not a sure preventive.

If dynamite was incapable of igniting or of causing an explosion, the problem of mine explosions would have been practically solved, but unfortunately there is not an explosive made for mining purposes but what will, when used in certain quantities and under certain conditions, ignite coal dust.

Using Two Explosives in One Hole Dangerous

Fifth. The inquiry into the cause of this explosion led me to suspect that some men in this mine would occasionally use two kinds of explosives (powder and dynamite) in the same hole. I am glad to say that this dangerous practice is not as common in this district as it has been. If two kinds of explosives are used today, it is usually without the knowledge of the shotfirer.

No matter what may be gained, if indeed there is any advantage at all, in using two explosives together, the risk of the practice to human life is too great, and it should never be permitted underground. All explosives should be used as was intended by the makers. Any other method makes each explosive less safe than if used alone.

Sixth. From the testimonies of the men working in the first and second west entries, we must conclude that the unfortunate victims of this explosion failed to examine the holes in these two entries. They simply inquired as to the number of shots that were to be fired, and that was all.

It would be far more agreeable to me to pass by this error and more charitable for me to say nothing about it; but duty demands that I point out the error of these men to other shot-examiners, and warn them against the temptation of allowing friendship and good fellowship to interfere with the performance of their duties. They should not neglect to examine every hole before it is charged.

I sincerely believe in the wisdom and the protective value of our shot-examiners' law, especially when the examiners employed are also shotfirers. This law acts like a safety valve, and without a question in my mind, has preserved us from great catastrophes.

Who Is to Blame for Accidents?

In "Accidents from Falls of Roof and Coal," J. A. Holmes, director of the Bureau of Mines, makes the following statements, which are to be commended in view of the fact that both operator and miner have repeatedly passed unfair judgments on each other:

"In discussing the causes of such accidents as those from falls of roof and of coal, little is to be gained by declaring that the miners or that the mine owner is mostly to blame. As a matter of fact, neither the mine owner nor the miner acting alone can entirely prevent such accidents.

"Each has his part to do and each is responsible for doing his part well. If the miners will coöperate with the mine owner and the mine operator will join with the miner in an earnest effort to prevent these accidents, many lives will be saved.

"Let both the miner, and the mine foreman coöperate with the inspectors in their efforts to safeguard life. Let 'safety first' be our motto and guide in practice as well as in theory, and the mining industry will receive public approval and assistance in bringing about other reforms which the coal-mining industry greatly needs."

Who's Who—in Coal Mining

Devoted to Brief Sketches of Prominent Men, Their Work and Ideas

Frank A. Manley—how the name brings up the thought that beneath an unruffled surface may be a strong resistant current. Affable, reticent and without a visual indication of aggressiveness, you meet him and you leave him more impressed with his personal merits than with the power he unquestionably has "to make things move."

We have too frequently confused mere hustle, noise and flurry with progress, so that we think "'something is doing" when disorder rules. But the born managers are not necessarily of the turmoil type.

If a complete greenhorn steps into a power house where leaky valves and ill-connected lines fill the air with steam and a series of knocks, sepulchral or sharp, come unpleasantly from crankpin, piston head and steam chest, he is duly impressed with the amount of generated power and a few noisy cams will enhance that impression. But there is more efficiency, more work per pound of steam in a quiet and vaporless engine room where the actions are fewer but better regulated.

In the subject of this sketch, the power to "transfer skill," as a colleague has put it, is well developed. This transference of skill, he may apply either to a machine or to the personnel which he controls. But if a man has it not, the operation of his affairs will be full of discord and everything will await his interference for its adjustment.

For this reason many managers prefer men of known unobtrusiveness, because they know that they always work through others, by a transference of their own skill rather than by the violence of their personal efforts. Set in motion, such an organization moves of itself, the spring revolves the wheels, the hair spring regulates the escapement and the balance wheel is compensated by the very action of those forces which would normally make its oscillations irregular.

Frank A. Manley was born Mar. 13, 1867, at La Rue, Ohio, his father being a druggist at that place. In 1874, the family went West, to Lincoln, Neb., and there the youth attended public school and was finally graduated at the State University with the degree of Bachelor of Civil Engineering, 1889.

It was a day of evolution, when Lincoln and the University were alike small. Manley was next to the head of the class, but as there were two only in the strenuous race, it is impossible for us to decide how much real merit was shown in the hand-to-hand struggle for precedence.

FRANK A. MANLEY

During the vacations, Manley worked in minor positions for the Burlington Road and for the City of Lincoln. After graduation, he returned to the Burlington, and, in the latter part of 1889, he secured a position in the engineering department of the Union Pacific Coal Co., at Rock Springs, in Wyoming.

At this time, the company operated mines at Almy, Rock Springs and Carbon, Wyo., at Scofield, Utah; at Chestnut, Mont.; at Baldwin and Como, Colo., and were opening two camps, Hanna and Dana, in Wyoming.

In 1892 he became chief engineer of the Union Pacific Coal Co. It was during this year that the company first used electricity for haulage purposes, installing a ten-ton Thomson-Houston, 500-volt locomotive in their No. 7 mine, at Rock Springs. Since then electricity has been installed in all the mines for haulage, mining and other uses, but the old original motor is still in service and still doing good work.

In 1897, July 1, he went with the Kemmerer Coal Co. and stayed with them 18 months, until they had opened and equipped their first two mines, laid out the town of Kemmerer, Wyo., and installed their electric-lighting plant and water-works system. P. J. Quealy was then and still is the general manager and half owner in the Kemmerer Coal Company.

Early in 1899 he returned to the Union Pacific Coal Co. as chief engineer and remained while the mining camps Spring Valley and Cumberland were started and the mines equipped and gotten into running order. During this year he married Miss Wood Hocker, daughter of Dr. W. A. Hocker, of Evanston, Wyoming.

Then the desire for freedom from a single corporation came as it has come to many of us. We feel that being unattached will give us an unfettered life, and we decide that to open up an office and seek for the commissions of the many will advance our aspirations more than to hide our bushel under the letterhead of a coal company, even if it operates in a half dozen different states.

F. A. Manley experienced this fatal delusion when he set out his shingle at Boise, Idaho, during the year 1903. As he himself says: "Surveying ditches and mining claims failed to excite his imagination or to inflate his bank account." So he returned to his former place with the Union Pacific Coal Co.

In January, 1906, the Superior Coal Co. decided to begin operations at Superior in the Rock Springs district, and he took charge there as general superintendent. Five mines were opened, a town built and equipment installed. This camp now is furnished power from a central electric power plant, consisting of six 300-kw. Curtis turbines with boiler plant, and a gas producer furnishing fuel to a generating unit of 150 kilowatts.

On July 1, 1909, he became assistant general manager of the Union Pacific and Superior Coal companies, and exactly two years thereafter succeeded D. O. Clark, the vice-president and general manager when he resigned and retired from active service. In 1905, F. A. Manley went to France to look into a briquetting scheme for the company, but found the method too expensive for the western conditions.

The mines of Frank Manley show his enterprise and originality. Any new development receives careful consideration, and provisions for safety are given an even more attentive hearing, despite the disadvantages they may entail.

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This journal is interested solely in matters relating to the fuel industries, and is designed to be a medium for the free interchange of ideas, the detailed description of coal-mining practice, and the expression of independent thought calculated to benefit both operator and miner.

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COAL AGE

A Unique Fireboss Examination

The mining law of the State of Washington does not require the examination and certification of any mine official, save only the state mine inspector, who must pass an examination before a board of examiners appointed for such purpose by the governor and consisting of three members—one mining engineer, one owner or operator of a coal mine, and one practical coal miner.

Appreciating the need of knowing the degree of competency of the men intrusted with the important work of examining its mines, the Northwestern Improvement Co. some time since adopted the system of conducting examinations for mine foremen and firebosses; and employing only such as could successfully pass the examination, which is held once a year.

In a recent examination, nine foremen and nine firebosses passed; the grade required was 75 per cent. for the foremen and 70 per cent. for the firebosses.

The firebosses' examination was unique and practical. The method adopted, with perhaps slight modifications, will undoubtedly receive the approval of all good mining men. It consisted of five written questions on which the candidates could make a possible 50 points.

Each candidate was then required to make an actual examination of a mine that generated gas, and in which the circulation in one section was purposely deranged. The examiners were stationed at different points in the mine and each candidate was graded according to the following schedule, which shows the number of possible points on each item:

	Points
Safety lamp; how handled	5
Gas; where found	20
Slant door; open, should be closed.	10
Drop sheets; misplaced or not up..	10
Timbering; poorly set or needed..	5

In approving such a practical test of the competency of would-be firebosses, we must not overlook the danger to which this system would expose both the candidates and the examiners, in the event of an accident due to the lack of experience or ignorance on the part of the men being examined. It is a rather serious proposition to intrust the examination of a section of a gassy mine, in which the circulation is deranged, to any but competent and experienced men.

The Rocky Mountain Coal Mining Institute

What the Rocky Mountain Institute will do in its coming sessions to modify the conditions in the Western mining camps can only be imagined. Certainly a region which has advanced so far without such an organization will do marvels when the information of each unit will be at the disposal of all.

The Western country stands wholly alone from the rest of the United States not only geographically, but in almost every problem. It is not in a position to find complete solutions for its difficulties in the experiences of the Eastern or Central coal basins, and it has never been disposed to wait on such information, but in true Western style has determined to make its own trails.

So, from Colorado and Utah, have come many advances in safety precautions. We hesitate to enumerate them, however, because we might, by chance, name among them developments almost contemporarily developed in the East. But the West has been at least, among the leaders in the use of stone dust, in the establishment of railroad rescue and instruction cars, in the purchase of traveling fans, in the fireproofing of timber used in the mines by the use of sheets of iron and in the firing of all shots at one time by a man stationed outside the mines.

It would be interesting to have dates on all these matters, and the Rocky Mountain Institute would do well to endeavor, before it is too late, to determine the date of these developments in mining and pay thereby, due honor to those who introduced them, thus affording encouragement to others.

As we have said, the West has its own difficulties, and is reaching out with all boldness to meet them. It is a regret-

table fact that the Western states have done much to raise the American mining death rate. In Colorado, in 1907, there were 7.86 lives lost per thousand men employed; in 1908, 4.25, and in 1909, 6.76, while in 1910, 21.6 men were killed in every thousand employees. In 1911, according to the statistics of the Bureau of Mines, the death rate fell to 5.61.

It is deplorable that so many fatalities should have occurred in mines which have been managed with such care. The Hastings mine is a marked instance of an explosion where the conditions seemed wholly unfavorable. That mine was exploded by a fireboss who was carrying a safety lamp. It seems that it was extended by the presence of coal dust, but the explosion traveled for thousands of feet over a course which was kept moist in many places by water which dripped from the roof.

It is true that there are some mines in Colorado not well equipped, just as such mines are found everywhere, and the fact that their age is great and future life short, has made the operators but little desirous to spend the large amount necessary for their improvement. Moreover, these mines are controlled by companies having but little capital.

But, on the other hand, these are not the mines which have prominence in reports of catastrophes. The most carefully managed mines are those which seem marked out for destruction. Under these circumstances how important are meetings to compare results.

If there is anything dilatory in England it is the weather bureau; on the contrary, none of our departments perhaps is more prompt in making returns. So we will have to discuss the weather in 1906. England takes her observations on humidity at 9 a.m. and 9 p.m., we take ours at 8 o'clock morning and evening. In 1906, the average monthly humidity of Stonyhurst, in Lancashire, never fell below 72.6 per cent. at 9 a.m. It reached that figure in July. In the same month the evening humidity was 90 per cent., but during the winter months, January, February, March, April, November and December, the evening humidities never averaged less than 98 per cent. and twice they are placed at 100.

Compare these figures with those of Denver, which is, by no means, in the dry part of Colorado. In fact, probably that is why we so seldom hear of disasters occurring in its neighborhood. The mean relative humidities were 57 per cent. for the whole year. During the winter months mentioned the maximum humidity was 75 and the minimum 49. B. J. Matteson in his remarks before the Rocky Mountain Institute stated that the humidity during the winter season outside the mines of the Colorado Fuel and Iron Co. did not average above 15 per cent.

It must be recalled that Denver was blessed with a rainfall of 16.84 in. in 1906, whereas one section of Colorado received only 9.2 in. The normal temperature of shallow mines is about 55 deg. F. The lowest temperature in Denver in 1906 was minus 5 deg. F., and it is probable that far lower temperatures were reached in other places. Thus the air leaving the outside and entering the mine increased in temperature about 60 deg. In Stonyhurst the lowest temperature was 21.3 deg. F., so that the air would become warmed only 34 deg., or a little less than half as much.

It is facts like these which make it childish to compare the West with Great Britain, so different are they in all their characteristics. In Scotland, explosions are quite frequent. In 1910 there were 70 separate accidents from explosions, resulting in only 96 deaths. What would have been the death rate had those 70 explosions, and many others which did not result in accidents, taken place in Colorado? We cannot tell. It is but justice to say that they would not happen so frequently in Scotland if, whenever they occurred, they left a line of dead and dying such as a single explosion leaves in Colorado. The Scotch returns under such conditions would doubtless show more fatalities and fewer explosions.

Tom Lawson Again

On Friday of last week there appeared in a number of the leading newspapers throughout the country, half-page advertisements by Thomas W. Lawson, inviting attention to an expose of the hard-coal combine appearing in the December issue of *Everybodys*. The article in question is not written by Mr. Lawson, but we presume that its purpose is to become a part of what Mr. Lawson so fondly and mysteriously terms "The Remedy." While it has not been out for a sufficient length of time to permit of a thorough review there are nevertheless, a few points in his arguments so obviously in error as to require no particular research to refute.

First we wish to congratulate Mr. Lawson on his acumen in the selection of the psychological moment for an attack of this character. With the decision of the alleged anthracite trust now pending before the Supreme Court, and the general public already inclined to be critical and uneasy, because of the shortage due to the six weeks' suspension in the mining regions, the *coup de main* has indeed been well timed.

The statement is made in the course of the article that the addition of 25c. per ton, made to cover the advance in wages granted the miners, increased the revenues of the operators 15 million dollars per annum; presumably this is computed on the basis of a production of 60 million tons. As a matter of fact, this 25c. per ton was only added to less than 60 per cent. of the total production, so that it meant an increase of only 9 million dollars to the operators. We also question the competency of the author of the article to judge whether the cost of production has decreased or increased in the last decade; it is worthy of notice in this connection that he has consistently ignored the greater depths to which it is becoming necessary to mine.

Again the author refers, in an offhand way, to a net gain of 14½ million dollars, made in 1907, through the recovery of small sizes from the culm banks, and in mining operation, amounting in all to something over 9 million tons. This shows a net profit of $1.60 a ton and we would like to see the detailed statement of how this is arrived at.

While the combination of large units has yet to prove itself a desirable or necessary adjunct in the industrial world of today, the independent corporation has long since shown that it is capable of effecting important economies in mining. If the anthracite companies have perfected such a combination of large units as to act in restraint of trade, that combination should be dissolved. But it is to be hoped that the single units may continue as before, and that such inaccurate and inflammatory statements as those contained in the article under discussion will be carefully weighed and tested before accepting.

Discussion by Readers

Comment, Criticism and Debate upon Previous Articles, and Letters from Practical Men

Should Mine Fans be Built Reversible

Letter No. 22—Notwithstanding the great number of practical mining men who take the opposite view, I am of the opinion that all mine fans should be non-reversible. Little good and much harm has already been done by having reversible fans. For my own part, I would not think of installing a reversible fan, for the reason that they are an ever-ready means of disaster, in the hands of well-meaning but misinformed mine officials. Many lives have been sacrificed by the reversing of the air current in the mine, by those on the surface, who, at the time, are unacquainted with the conditions existing in the mine.

It has often happened that an experienced miner, with a cool head and a good knowledge of the mine and its system of ventilation, has started to lead a group of survivors, confident that he could bring them safely to the surface; when suddenly he discovers that the air has been reversed and their chances of escape are almost, if not entirely, cut off by reason of this change.

Again, in the case of a fire raging in the mine, if the fan is reversed, the effect may be to drive the explosive gases generated by the fire and which have become mixed with fresh air, back on the fire. This, in many cases, would cause a disastrous explosion that would destroy whatever hopes might have existed that the survivors, in the mine, might make their escape.

My judgment is that more attention should be given to the installing of efficient exhaust fans. Watch carefully the condition of the return air; keep the mine free from standing gas; discourage the use of black powder and short fuses, and prohibit the use of two kinds of explosives in the same drill hole; avoid placing a shot so that it will face a strong air current. See that the mining law is carried out in every detail. Following along this line, there will be less cause for trouble and fewer mine accidents will result.

EDWIN HUSBAND, Supt.,
Wadsworth Red Ash Coal Co.
Helena, Ala.

Letter No. 23—To a man in charge of a gaseous mine, this discussion is very interesting. Although, at present, out of that class I may say that when in charge of a dangerous gaseous mine a reversible fan always seemed to me to be a desirable feature of the equipment.

Probably every mine superintendent has a certain course or plan mapped out in his mind, for use in time of need. For myself, I will say that whether right or wrong, in case an explosion should occur in our mine, I would first ascertain the damage to both the intake and discharge openings, and would endeavor to start the air so as to enable rescue parties to enter the mine by the least damaged or most feasible route. Generally speaking, the above would be my course of action.

The situation here, perhaps, is peculiar. For example, our No. 1 mine was started some years ago on the north side of the hill, where a blower fan is now located. The workings have since been driven to the south side. The opening on the north side is still maintained as the intake for the mine, and the south-side opening is the discharge; these openings are 8000 ft. apart. Should an explosion occur in this mine and the fans were not reversed, all the products of combustion and the gases from the old workings at the north end would be driven upon the men. On the other hand, if the fan were reversed the men would receive fresh air from the south opening. Pumping and other considerations make it desirable to maintain the north-side opening as the intake. It appears to me that circumstances must determine the answer to this question, in all cases.

J. D. JONES, Supt.,
The U. S. Coal Co.
Bradley, Ohio.

Letter No. 24—I consider the reversing of a mine fan a serious matter. I cannot understand why the air should be reversed. I have been ventilating mines for the past 28 years, and have yet to see the time when anything could be gained by reversing the air.

Suppose, for a moment, a fire starts on one of the cross entries in a mine. I have found it much better to short-circuit the air current as close as possible to the fire; and, by arranging certain doors and stoppings, conduct the smoke and fumes of the fire directly into the main-return airway.

I remember very distinctly one occasion when it was necessary to build a temporary overcast, to conduct the smoke across the main intake, to the return aircourse. We accomplished this by putting up some 2x4 pieces across the entry and nailing brattice cloth to them. The plan worked successfully. In most every mine, the doors are hung to close with the current; and if the air is reversed these would all be blown partly open by the pressure of the air against them. This would cause the air to short-circuit at these points. It usually happens, however, that an explosion destroys most of the doors and the stoppings; and, in this case, a reversible fan would be of no use.

Again, it must be remembered that reversing the fan may drive a quantity of blackdamp accumulated in some abandoned places, upon the men. For these reasons, I cannot see that it is policy to incur the extra expense of installing a reversible fan.

DAVID WATKINS,
Mine Superintendent.
Coalfield, Tenn.

Reversing the Air Current in the Mine

It happens sometimes that a contributor turns

.....poet,
And doesn't know it;

as the following somewhat revised and metered lines will show:

1
No! The fan should not reverse
When there's trouble down below;
We've the safe five-entry system,
Many roads to come and go.

2
Hark! A muffled roar like thunder,
Warns the miner he must flee,
Through the dark and winding airways;
The old-accustomed road knows he.

3
Hurry, skurry, here and yonder
Come the men, from room and heading,
Through the gathering smoke and blackness,
Guided by the air, unerring.

4
But what is this, the air is baffling,
There's uncertainty below,
For some hasty, Tom-"fool foreman"
Changed the fan, exhaust to blow.

5
Now, alas, the men bewildered,
Double back upon their tracks,
Stifled, choking, stumbling, bleeding,
Their clothing burning on their backs.

6
Smoke and flame and now another
Blinding flash and rush of air,
Tell the miner all is over,
And he bows himself in prayer.

7
Let this simple rhyme and rhythm
Teach a lesson good and true:
Till the men below you rescue
Make no change for airways new.

Dubois, Penn. P. F. Costello.

The Examination of Mine Foremen

We have many good men in the mining fraternity who are thoroughly competent in every way to fill the position of first-class mine foreman, but who, when it comes to the test of a written examination, are so confused that they do not make a grade worthy of a trapper boy.

On the other hand, we have men holding first-class certificates, by reason of possessing a little theoretical knowledge gained by a few nights' study of some technical books, and a reckless disregard of the truth in stating the number of years' experience they have had in mining. Frequently, in actual practice, these men cannot distinguish a crosscut from a heading.

It is certainly a bad state of affairs and one that demands careful consideration to determine its remedy. In order that we may deal justly with both classes of these men, I would suggest:

Make the examination of candidates for the position of mine foreman more practical and give more attention to oral questions. By doing this we would increase the chances of the good practical man and give him the opportunity that he deserves; and at the same time put the petty theorist of a few nights' study to a severe practical test.

Few practical mine foremen are expert penmen, or authorities on grammar or rhetoric. That is entirely out of their line of business, and is not necessarily a prerequisite to getting out coal and handling men.

I have known good men to fail to pass a mine foreman's examination, simply because their writing was not legible or their statements lacked unity. Others had to give up before the examination was over, because their hands and arms became badly swollen from the effort to hold a pencil in their fingers. Still others have failed because of sheer fright at the length and detail of the examination. Had the questions been asked orally and in an assuring tone, the result would have been different. A little incident that occurred at one of the recent mine-foremen examinations in this state will serve to illustrate this fact.

An old man, who had spent the greater part of his years in mines, and was acknowledged to be a practical and competent mining man—one who could be depended on not to lose his head in any emergency that might arise around the mines—decided to try the examination for a first-class mine-foreman's certificate. The inspector of this district, who was a member of the examining board, seeing this man's agitation walked over to him, and calling him by name, asked him what was the matter. "Well," he said, "here they have given me a question asking 'what is carbon dioxide? Give its symbol and atomic weight. Of what is it composed and in what proportions? What quantity will produce death,etc?'" "But you can answer that question," said the inspector. "Yes," replied the man, "but if I write it all out I am afraid I shall have to cut some of the other questions short in order to get through on time, because I am not accustomed to writing very much at one time." The inspector then told him to answer the question in his own simple language and not go into unnecessary details. This is what he wrote: "Carbon dioxide, which I call blackdamp, is heavier than air and makes a feller pant and get all het up."

Now compare, in your own mind, this answer with the one given by a fast penman—a candidate in the same examination—and which he had committed to memory for the occasion, perhaps, only the night previous. Ask any fair-minded coal operator which of these two men he would rather have in charge of his mine as foreman. Do you doubt his answer?

After all has been said, pro and con, the fact still remains that the written examination is not always a true test of a man's ability to act in the capacity of a mine foreman.

F. M. McDANIEL,
Mining Engineer.
Clarksburg, W. Va.

The Hastings (Colorado) Explosion

I was much interested in the article of John Verner, COAL AGE, Nov. 16. p. 677, and the appended note, p. 678, to the effect that the statement of Mr. Verner could not be followed, adding, if moisture did not arrest the explosion, what did?

Having been at Hastings, at the time of the explosion, I agree with Mr. Verner in his statement suggesting that the moist condition of the dust did not, in this case as in many others, stop the explosion. In my article sent you this week bearing on explosions of coal dust, I have stated my reason why the Hastings explosion stopped where it did, after having traveled half a mile.

My opinion in respect to a dust explosion exhausting itself is based on facts that are well understood, and I need not explain them here, further than to say that, after a long and varied experience, I am firmly convinced that the stone dust method will eventually prove to be far more reliable for arresting explosions in mines and accomplish better results than we can ever hope to secure by the wet treatment or moisture zones.

We, at Delagua, have never placed any reliance on the Taffanel barrier; or, for that matter, upon zones in general. I believe that Taffanel's own opinion of the value of the "barrier" has recently been shaken. While it appears quite possible that such a barrier as he has suggested, namely, overhead shelves covered with fine ashes or stone dust, might occupy such a position in the mine passages as to effectually stop an explosion; yet it must be admitted that if the barrier happened to be at some considerable distance from the point where the explosion started, and a large quantity of coal dust occupied the entries between the barrier and the original explosion, there might be so much coal dust thrown into suspension in the air by the force of the explosion that when the flame reached the barrier the amount of inert stone dust would prove insufficient to arrest the explosive wave.

Under these conditions it is easy for us to be misled and suppose that stone dust has little value as a means of arresting an explosion. It is easy, under the conditions that existed in the Hastings explosion, for a moisture enthusiast to claim that the arrest of the explosive wave was wholly due to the moist condition of the entries at the point where the explosion stopped. Give to each factor its due credit and do not suppose the effect is due to one cause alone, however, effective that cause may be in another instance.

SAMUEL DEAN, Chief Engineer,
The Victor American Fuel Co.
Delagua, Colo.

[The factors operating to arrest an explosion of dust, in mine workings, are numerous. Each of these factors, admittedly, has its due share in the work, in any particular case. It is often difficult to determine the relative importance of these resisting factors, all of which are generally conceded to have operated in opposition to the explosive wave. Perhaps, no one of them could be said to *arrest* the explosion, but this was due to the influence of all combined.

It is a mistake to assert the inefficacy of any known existing factor, in the strong manner in which Mr. Verner denounced the influence of the wet zone in the particular case of the Hastings explosion. We do not believe that Mr. Verner, or anyone else, is authorized to assume that the moist condition, in this or that particular case, was ineffective or, perhaps, was not the controlling factor in arresting the explosion.

The question asked in the appended note, "If moisture did not arrest the explosion, what did?" was only intended to suggest a further full discussion of the question, inasmuch as Mr. Verner seems to assume, in his remarks, that the explosion continued, ignoring the fact of its stay in a comparatively moist place, in the airway. Personally, we believe the expansion that took place at the point where the explosion died out was the most important factor in arresting its progress, in this case.—EDITOR.]

Inquiries of General Interest

All Questions Must be Accompanied by Name and Address—Not for Publication

Removal of Firedamp

Referring to the answer given in COAL AGE to the second question on p. 585, Oct. 26, permit me to suggest that while the answer given is correct, in respect to the removal of *afterdamp,* I think it is misleading to assume that the question refers to the removal of afterdamp instead of firedamp as stated. The question does not explain the conditions in the mine, and these must be assumed.

I should assume that the question means to say that the explosion was confined to one section of the mine, on the return side of the section containing the firedamp. A fire may have started, as is frequently the case, in the section where the explosion occurred. It is, therefore, necessary to take steps to prevent the firedamp being carried toward the fire.

GEO. WM. HALLIDAY,
Fireboss.

Royal View, Alta., Can.

We agree with our correspondent that the question has failed to explain the conditions. It reads as follows:

How would you remove firedamp from a section of the mine, after an explosion; what dangers would you expect to meet and how would you overcome them?

The reading of this question leaves no doubt but that the mine is divided into sections, which are presumably ventilating sections. If this be true, the return current from each section passes directly into the main return airway, without passing through another section of the mine. It would be contrary to good mining practice to assume that the question contemplates making any attempt to remove the firedamp from one section of the mine, after an explosion has occurred in another section, until the trouble due to the explosion was completely removed, in which case the removal of the firedamp from the other section would be accomplished in the usual manner.

But, the mention of an explosion having occurred leaves us to suppose that the question refers to the removal of *afterdamp* and not firedamp. As previously stated, it would be impracticable and unsafe to make any attempt to remove accumulated firedamp from a section of the mine, until the dangerous effects of the explosion in another section had been removed. Therefore, the natural conclusion is that, since the question, as it reads, presents two conditions not in keeping with practice, there is a probable error in its statement, and the removal of afterdamp is contemplated instead of firedamp.

A Boiler Test

The following data were obtained in a recent boiler test made at a certain power plant. The test showed 34.5 lb. of water at 212 deg. F., evaporated into steam at 90.3 lb. gage pressure, by the burning of 5 lb. of fuel. Following are the analyses of the fuel used and the cinder resulting:

	Fuel	Cinder
Carbon	75 per cent.	35 per cent.
Ash	20 per cent.	64 per cent.
Loss	5 per cent.	1 per cent.

The fuel has a calorific value of 12,100 B.t.u. per pound of fuel.

I would like to know the efficiency of the combustion, or the amount of the heat in the fuel, utilized in producing steam, and the amount of the heat lost through radiation and passing up the stack.

MINE FOREMAN.

Trinidad, Colo.

From the analyses of the fuel and the cinder, we first determine the amount of carbon actually burned as

$$\tfrac{35}{64} \times 20 = 10.9375 \textit{ per cent.}$$

The available carbon in the fuel is therefore 75 — 10.9375 = 64.0625, and the efficiency of the combustion is then

$$\frac{64.0625}{75} \times 100 = 85.4 \textit{ per cent.}$$

From the steam table (Kent), a steam pressure of 90.3 lb. gage, at sea level, corresponds to a temperature of 331.4 deg. F.; and 1 lb. of steam, at this temperature, contains 1187.2 B.t.u., above 32 deg. The heat required then to evaporate 1 lb. of water at 212 deg. F., into steam at the given gage pressure, at sea level, is 1187.2 — 180 = 1007.2 B.t.u.; and to evaporate 34.5 lb. of water, under the same conditions, will require 34.5 × 1007.2 = 34,748.4 B.t.u.

This work was done by 5 lb. of coal, the efficiency of the combustion being, say 85.4 per cent.; or, practically, 5 × 0.854 = 4.27 lb. of fuel completely burned. The total available heat in the fuel is, therefore, 4.27 × 12,100 = 51,667 B.t.u. This gives the amount of heat lost by radiation and through the stack as 51,667 — 34,748 = 16,919 B.t.u.

Tabulating the above items on the basis of the unit weight of fuel, gives the following figures:

	Heat Units	Per cent.
Heat lost in the ashes, per lb. of coal	1,766	14.58
Heat utilized per lb. of coal	6,950	57.44
Heat lost through stack, etc., per lb. of coal	3,384	27.98
Total heat in the fuel	12,100	100.00%

Commercial Sizes of Anthracite Coal

Kindly describe what is meant by the following terms as used in coal mining: Mine run, washed screenings, slack, lump, buckwheat No. 1, buckwheat No. 2, buckwheat No. 3, pea, rice, etc. These and similar terms are often applied to the different grades and kinds of coal, and a full explanation of them and any other terms used in describing coals would be of interest.

Chicago, Ill. PHIL. LIGHTE.

The term "mine run" describes the coal as it comes from the mine and is loaded without screening. It includes all the large sizes and the screenings.

In the preparation of anthracite coal for the market, the coal is usually sized at the breaker, by passing it through certain rolls and over screens of fixed sizes of openings. The sizing of the coal is in accordance with the demands of the market. The different sizes have different names; and, frequently, different names are applied to the same size, as will appear in the following table.

TABLE SHOWING THE AVERAGE MESH OF SCREENS USED IN SIZING ANTHRACITE COAL

	Hand picked over 6″ in diameter				
	Woven wire		Round punched plate		
	Through	Over	Through	Over	Remarks used by
Steamboat			6″	4½″	Railroads
Broken	4″	2¾″	4½″	3½″	Gas house
Egg	2¾″	2″	3¼″	2⅝″	Furnaces and heating stoves
Stove	2″	1¼″	2⅛″	1⅜″	
Nut	1¼″	¾″	1⅛″	⅞″	Ranges and cook stoves
Pea	¾″	½″	⅞″	⅝″	Furnace and steam
Buck No. 1	½″	⅜″	⅝″	½″	Steam
Buck No. 2 (Rice)	⅜″	.. *	½″	¼″	Steam
Buck No. 3 (Barley)	..	..	¼″	3/32–⅛″	Steam
Buck No. 4 (Barley No. 2)	..	..	3/32″	1/16″	Steam

*Goes over the ¼-in. round punched plate.

Examination Questions

Selected from State Examinations, or Suggested by Correspondents

Examination Questions

(Answered by request)

Ques.—(a) What is the proportion of marsh gas and air, in a firedamp mixture, that will develop the maximum explosive force? (b) What are the limiting proportions that determine an explosive mixture of these gases?

Ans.—(a) The proportion of marsh gas and air in a firedamp mixture, at its maximum explosive point, is practically 1 volume of gas to 9.5 volumes of air; or, more exactly, 1:9.57. The mixture then contains 9.46 per cent. of marsh gas.

(b) The limiting proportions of an explosive mixture of marsh gas and air; or, in other words, the explosive limits of marsh gas are as follows:

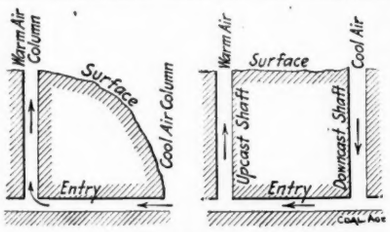
Lower limit, 1 vol. gas; 13 vol. air;
Higher limit, 1 vol. gas; 5 vol. air.

Ques.—Explain how the temperature of the mine influences the circulation of air. Is this effect the same in drift mines as in shaft mines?

Ans.—The air current in its passage through the mine partakes of the temperature of the mine. When this temperature is higher than that of the outside air the upcast column, in a shaft mine, is warmer and lighter than the downcast column. In this case, the temperature of the mine acts to assist the circulation produced by the ventilator. If the temperature of the mine is below that of the outside atmosphere, the upcast column, in a shaft mine, will be cooler than the downcast, and this condition will act to oppose the circulation of air produced by the ventilator.

The circulation in a mine due to the difference between the outside and inside temperatures, is called the natural circulation; that produced by the ventilator is the artificial circulation. Since the outside air is generally colder in the winter and warmer in the summer than the mine air, it follows that to produce the most favorable conditions from an economic standpoint, the circulation should be changed, summer and winter.

In a shaft mine, shown on the right of the accompanying figure, the natural-air column will assist the circulation in winter and oppose that in summer; because the downcast column, whether the fan is exhausting or blowing, has practically the temperature of the outside air, and the upcast column that of the mine. In a drift mine ventilated by a shaft, shown on the left in the accompanying figure, the shaft column always partakes of the mine temperature, and this is naturally an upcast in winter and a downcast in summer. However, except in a very deep shaft, there is not the same difference between the temperature of the shaft and that of the outside air in summer as in winter, because the temperature of the downcast air is not materially lowered in the shaft but becomes cooled in passing through the mine, which, however, does not affect the circulation in a level seam.



DIAGRAMMATIC CROSS-SECTION OF A DRIFT AND A SHAFT MINE

Ques.—Define a permissible explosive.

Ans.—An explosive is called a "permissible explosive" when a sample similar in all respects to the manufactured explosive has passed the test prescribed by the National Bureau of Mines; it being further provided that such explosives must be used in accordance with the conditions prescribed by the bureau.

The Bureau of Mines reserves the right to revise, from time to time, its list of permissible explosives; and to adopt additional and more severe tests to which all permissible explosives shall be subjected, and such additional tests as may, in the opinion of the engineers in charge, be required to properly safeguard the lives of miners. Used under other conditions than those prescribed by the Bureau of Mines, any explosive on the permissible list ceases to be a permissible explosive.

Ques.—State, briefly, the general requirements of a permissible explosive.

Ans.—A charge of the explosive must pass a certain ballistic test, which determines its relative power or explosive force, with respect to that of ½ lb. of 40 per cent. nitroglycerin dynamite of the following composition: nitroglycerin, 40 per cent.; nitrate of soda, 44 per cent.; woodpulp, 15 per cent.; carbonate of lime, 1 per cent. Each charge shall be fired with an electric detonator (exploder or cap) strong enough to completely explode the charge. Both the chemical and physical tests must show no unfavorable results.

Each explosive is subjected to four separate tests, in the testing gallery. Ten shots are fired, in each test, and if no ignition of gas or dust takes place the explosive is considered to have passed the test. The tests are as follows:

(1) The charge, tamped with 1 lb. of clay, is fired into an 8 per cent. mixture of gas and air (firedamp), no dust being used in this test.

(2) The charge, tamped as before, is fired into a 4 per cent. mixture of gas and air, and 20 lb. of bituminous coal dust, 18 lb. being distributed on shelves along the sides of the first 20 ft. of the gallery, and 2 lb. where it will be blown into the air.

(3) The charge, tamped as before, is fired into 40 lb. of bituminous coal dust, 20 lb. on the shelves and 20 lb. on a trestle in front of the shot.

(4) This test is to determine the limit of charge. A 4 per cent. firedamp mixture is used and 20 lb. of bituminous coal dust, as in the second test. In each test the temperature of the gallery is 77 deg. F.

Ques.—What precautions are taken by the Bureau of Mines to insure that the explosive sold and used corresponds to the sample tested?

Ans.—A list of the explosives that have passed the requirements and are entitled to be classed as permissible explosives is furnished to each mine inspector, and published, from time to time, by the bureau. At different times, the bureau collects samples of the permissible explosives used in different mines by the miner. These samples are subjected to the same test as the original samples of the explosive. Should the samples thus taken fall short, in the test, the bureau reserves the right to withdraw the name of such explosive from the permissible list.

Ques.—What weight of permissible explosive is recommended by the Bureau of Mines to be used in single shot?

Ans.—The weight of explosive used in a single shot must not exceed one and one-half pounds (1½ lb.).

Ques.—Are the "permissible explosives" that are now being used to blast coal more safe than black powder?

Ans.—Yes. The so called "permissible explosives," if properly chosen and adapted to the coal and properly used in blasting, are safer than black powder; because they produce less flame and a smaller quantity of the explosive is required to do the same work.

A Good Training School

SPECIAL CORRESPONDENCE

There are probably very few mines in the country that have produced more General Managers, General Superintendents and Superintendents than the Sopris mine, which is located about 4 miles southwest of Trinidad, Colorado. It is owned and operated by the Colorado Fuel & Iron Co., was opened in the year 1888 and has been a steady producer ever since.

The following is a list of the men who have risen from the ranks and who at one time worked at Sopris. It is interesting to note that all of these men were employed there when W. J. Murray was superintendent:

W. J. Murray, vice-president and general manager, Victor-American Fuel Co.
T. H. O'Brien, general manager, Stag Cañon Fuel Co.
B. J. Mattison, assistant manager, Colorado Fuel & Iron Co.
Joe Smith, general superintendent, Stag Cañon Fuel Co.
Wm. McDermott, general superintendent, Victor-American Fuel Co.
Jos. Ball, formerly division superintendent, Colorado Fuel & Iron Co.
*Thos. Pattison, formerly general superintendent, American Fuel Co.
Jos. Curran, superintendent, Sugarette, St. Louis, Rocky Mountain & Pacific Co.
*George McDermott, formerly superintendent, Tercio, Colorado Fuel & Iron Co.
F. P. Bayless, superintendent, Cokedale, Carbon Coal & Coke Co.
John Jennings, superintendent, Bartlett, N. M., Victor-American Fuel Co.
Frank McDermott, superintendent, Ramey, Huerfano Coal Co.
Harry Elliott, superintendent, Gordon Mine.
Bert Lloyd, ex-deputy state mine inspector.
M. G. Smigelow, superintendent, Brilliant, St. Louis, Rocky Mountain & Pacific Co.
*Wm. Skidmore, formerly superintendent, Tercio, Colorado, Fuel & Iron Co.
James McDermott, superintendent, Navajo, N. M., Victor-American Fuel Co.
Chas. Chambers, superintendent, Sopris, Colorado Fuel & Iron Co.
N. J. Chapin, superintendent of machinery, Victor-American Fuel Co.
Wm. Hutchins, superintendent, Dawson, Stag Cañon Fuel Co.
*Deceased.

Pittston Mining Institute Banquet

The annual banquet of the Pittston Mining Institute will be held tonight, Nov. 30, at the State Armory. Judge John M. Garman, of Wilkes-Barre, will preside as toastmaster, and addresses will be made by Thomas Thomas, mining superintendent of the Lehigh Valley Coal Co., and C. E. Tobey, superintendent of the Coal Mining Department, Delaware, Lackawanna & Western R.R. The music will be furnished by the Bone Orchestra and by a male quartet.

American Institute of Mining Engineers

A meeting of the New York Section of the American Institute of Mining Engineers was held at the Engineering Societies Building, 29 West 39th street, New York, on Friday Nov. 22, at 8:30 p.m. After a short resumé of the proposed amendments to the constitution of the institute, which among other changes, design to replace the board and council by a single governing board, a paper was read by N. H. Darton, geologist of the Bureau of Mines, on "The Structure of the Northern Anthracite Basin, Relative to Forms of Folds."

Mr. Darton has prepared two charts, one of which shows the contours at 100-foot intervals of the lowest bed in the anthracite field, namely, the Dunmore or Red Ash and the other, the thickness of the glacial drift over the same area. The contour map was made at the expense of much labor and is based on information furnished Mr. Darton by the coal corporations and is derived from borings and mine maps.

It gives most valuable information on the probable elevations of the base bed in the anthracite field. However, where drillings had to be relied on as, for instance, south of Wilkes-Barre, or where the Red Ash bed was not worked the facts obtainable had to be aided by conjecture based on stratigraphic reasoning. Care has been taken to distinguish lines based on sufficient data from those which result from inferences, by making the first lines solid and the second, broken.

NONPARALLELISM OF COAL BEDS

Mr. Darton did not attempt to systematize the folding of the field under discussion. The irregularities are too many and variable to be described in the simple manner which once found vogue. In fact his lecture was to exhibit the reason for the irregularities and the difficulties associated with drafting of contour lines. Cross-sections are not hard to make when borings have been made in file, but how to connect these is no simple problem.

Mr. Darton showed how the softer beds and those rendered weak by being included between softer measures crumple into severer folds than hard beds which superpose or underlie them. Such a bed is that known as the Baltimore. In the cross-section of a shaft, the beds at the top of the section were inclined gently to the right. The lower beds gradually inclined more and more to the left and when the Baltimore bed was reached, it was found to be folded sharply into an overthrow of a marked character.

The author is to be congratulated on having performed a work of permanent value at the expenditure of no little effort and labor, and above all for the conservatism which has marked his conclusions. While his investigation was conducted primarily to determine the relation between stratigraphy and the occurrence of methane, it will serve to give a solution, reasonably correct in most cases, of many a knotty engineering problem, especially in the lower third of the northern anthracite field.

Kentucky Mining Institute

On Monday, Dec. 9, at 1:30 p.m., the Kentucky Mining Institute will convene at the College of Mines and Metallurgy, State University, Lexington, Ky., and an address of welcome will be delivered by Judge Henry S. Barker. After a business session, papers will be read by Frank D. Rash, president of the institute, vice-president and general manager, St. Bernard Mining Co., on "Forestry as related to Mining," by Hywel! Davis, president of the Mine Owners' Association of Kentucky, on "The American Mining Congress," by J. D. Rogers, superintendent of mines, Consolidation Coal Co., on "Preparation of a Domestic Coal," by H. LeViers, manager North-East Coal Co., on "The Successful Foreman from Four Viewpoints," and by J. W. Pryor, of the State University of Kentucky, on "Hook Worm."

The session will conclude with some remarks by W. L. Moss, general manager, Continental Coal Corporation, on the plans already outlined for a first-aid contest, to be held next May, by the Kentucky coal companies at the summer meeting of the Kentucky Mining Institute. The program is expected to continue into the evening, the latter session beginning at 8 o'clock.

Machine Mining in the West

SPECIAL CORRESPONDENCE

Probably in no other department of coal mining in the West have such strides been made as in the undercutting of coal by machines. The current year has been almost revolutionary in this respect, probably more machines having been installed than were previously in use.

This is largely due to the introduction of a successful shortwall or continuous-cutter machine. The amount of physical labor necessary to manipulate chain breast machines caused a very general dislike to this type among the miners, and it was exceedingly difficult to get skilled operators to handle them. The shortwall type, however, being entirely handled by power, and needing no manual labor at all, has entirely changed the attitude of the machine men, and they are now welcoming the opportunity to run machines, where formerly they could not be induced to touch them.

It is probable that the next year will see an even greater number of machines installed, for the results obtained have been satisfactory to the mine operators.

Coal and Coke News

From Our Own Representatives in Various Important Mining Centers

Pennsylvania

ANTHRACITE

Hazleton—By an agreement in the tax case against the Kingston Coal Co., operating mines in Luzerne county, the Commonwealth of Pennsylvania gained $22,000 a year, the company consenting to increasing the tax valuation of its property from $1,600,000 to $6,000,000 and paying $90,000 back taxes.

Pottsville—For twenty-odd years a fire has been smoldering in the mammoth vein of the Blast colliery at Pottsville. Recently fumes from the burning coal stopped work on the stripping and the officials are now preparing to bore holes into the burning section to slush it.

The special commission from the Bureau of Mines and the leading universities of the country, appointed by the Government to study resuscitation from electrical shock, met in the C. & I. Building Nov. 16. Superintendents and representatives from various coal companies were present.

Mahanoy City—Because the Lehigh Valley Coal Co. discharged a number of men and boys for the purpose of retrenchment, 4500 employees at the various collieries in this region went on strike Nov. 20 and tied up the system.

Wilkes-Barre—The greater part of the cellar of Daniel Corrigan's house, in Luzerne Borough, dropped into the workings of the Raub Coal Co., Nov. 20. For a time it was feared that the entire building would fall into the opening, which was about seventy feet in diameter, and about thirty feet deep, but this was prevented by means of timbers placed by the company.

Pittston—Eighteen men were injured, seven of them perhaps fatally, in a mine cave at the Barnum Colliery of the Pennsylvania Coal Co., at Pittston, this afternoon. Among the injured were Supt. A. J. Yetter and Foreman J. J. McNulty. The cave occurred in the Marcy vein, in a robbing section, and pulled down part of the Pittston vein. The men were rescued about an hour after the cave, through the No. 9 shaft, the cave having occurred in the No. 3 shaft workings.

BITUMINOUS

Pittsburgh—A civil service examination will be held on Dec. 9 to secure eligibles from which to make a selection to fill the vacancy in the position of Instructor of Mine Safety, at a salary ranging from $1800 to $2400 a year, in the Bureau of Mines at Pittsburgh.

Whiteside—The Madeira-Hill Coal Mining Co. suffered the loss Friday evening, Nov. 5, of about $15,000 as the result of a disastrous fire which totally destroyed the power house at their Elizabeth operations at Whiteside, not far from Houtzdale.

The building destroyed comprised the boiler house, and the engine and compressor rooms. The machinery was damaged very materially, but General Superintendent Wilburn hopes to be able to be shipping some coal at least within the next week. He has a force of men at work getting things in shape.

The fire broke out about 5:30 in the evening, and is thought to have been occasioned by the explosion of a lamp in the hands of the night pumpman.

Uniontown—While 150 men were at work in the Orient coal mine, 9 miles from here, an explosion of gas occurred Nov. 19. The gas was fired in the entry and only three men were injured.

West Virginia

Charleston—What is believed to forecast the end of the great coal strike in the Kanawha field of West Virginia was announced Nov. 22, in a signed wage agreement between the Union miners and the officials of the National Bituminous Coal & Coke Co. The agreement provides for an increase of about 21 per cent. in wages, permits the miners to organize, provides for a nine-hour day and gives the men now on strike preference if they should desire to return to work.

Alabama

Winston—In the bankrupt case of the Warrior Coal & Lumber Co., Referee Bertolet was asked to grant a petition for the sale of 3910 acres of coal and lumber lands in Winston, Ala. Nov. 23 was set as the day for a hearing in the matter.

Ohio

Rogers—The Mullins Coal Co. is rapidly equipping the old plant of the Quaker Coal Co., into one of the most uptodate mining plants in eastern Ohio. The improvements are now nearing completion, so that the mines will soon be in full operation.

New Waterford—Operators prospecting near this village have struck a rich bed of coal a half mile from the center of the town. Eastern Ohio capitalists control the rights and will spend $50,000 in developing the mine and will eventually employ about 500 men.

Massillon—Two miners were caught in a fall of cribbing and quicksand just after they entered the mine, Nov. 18. One was killed instantly and the other died shortly after the rescuing party had dug him out. The shaft is the property of the Massillon Mining Co., and is 80 ft. deep.

Indiana

Sullivan—The mine being sunk at Paxton by the J. Wooley Coal Co., is now down about 250 ft., and has about 30 ft. more to go to reach the coal. The shaft is expected to be completed early in December, and it is said that the company will build a large number of houses in the spring.

Brazil—A coal-land deal has been practically closed whereby eastern capitalists will take over the coal and clay pit west of Staunton. Options on lands about the present pit were also consummated. A thick bed of good coal exists here only a few feet below the surface, and by installing two steam shovels and employing a large force of men, the new company expects to have one of the largest coal-stripping pits in the state.

Seeleyville—Nearly 300 miners employed at the Rose Bud mine of the Vandalia Coal Co., went on strike recently, when the company refused to clean the slate from the rooms. It is hoped that the strike will be of short duration.

Terre Haute—Six new machines have been added to the equipment of the Wabash mine during the past few days, making a total of 20 now in use. Several machines were lost in this mine recently by reason of a cave-in.

Clifton—Two shot-firers were killed by an explosion in a mine owned by the Dering Coal Co., Nov. 16. Powder cans and parts of the cages were hurled from the bottom of the mine several hundred feet into the air and fell among the workmen who were just quitting, but no one was injured.

Illinois

Chicago—The Lake Shore, Big Four and the Chicago, Indiana & Southern Ry. companies, together with the O'Gara Coal Co., were indicted Nov. 22 by the Federal Grand Jury, charged with giving and receiving a $60,000 rebate. The suit

grew out of the payment of $60,000 by the railroads in the latter part of November, 1909, to the coal companies, for which no proper accounting was made to the government.

Pana—A præcipe was recently filed in the Circuit Court of Christian County, by which the Smith-Lohr Coal Co. sued the Pana Coal Co., for $75,000 damages for alleged encroachment on the coal lands owned by the latter company.

Springfield—With the purchase of 30,000 acres of coal land in Macoupin County, and the contract for options on 280,000 acres of coal land in Macoupin, Montgomery, Saline and Jefferson counties completed, Eastern capitalists are expected to open up a number of new mines in the coal fields of Southern Illinois, within the next two years.

Duquoin—Local operators who have been seriously handicapped in filling their orders, as a result of a car shortage, are hopeful that the announcement of the Illinois Central that relief is in sight will soon materialize. The Central officials say that 35,000 new coal cars, together with several heavy new locomotives especially adapted for coal hauling will be soon put in use.

Johnson City—A coal deal has been consummated, by which the Furlough Coal Co., a New York corporation, acquires the property of the Lake Creek Coal Co., near Johnson City, in the Williamson County field.

Colorado

Trinidad—The Forbes coal mine, with 1000 tons daily capacity, owned by the Chicosa Fuel Co., and located 18 miles north of Trinidad, has been sold to the Rocky Mountain Fuel Co., for $150,000.

Denver—Mine-rescue Car No. 2, of the U. S. Bureau of Mines, was expected at Denver, Nov. 1. The car will be in charge of Mine Foreman W. D. Schofield, who will give the demonstration. On Nov. 30 the car will proceed to Ideal, Colo. From there it will go to other towns, leaving Colorado the latter part of December.

Instruction in mine-safety methods will be given at each place, and an illustrated lecture on greater safety in mining will be delivered each evening.

The majority stockholders of the St. Louis, Rocky Mountain & Pacific Co., owner of the largest coal field in the United States, have pooled their interests for the purpose of selling the control of the company for $7,500,000.

The company's coal lands, covering 812 square miles, or 520,000 acres, are located in southern Colorado and northern New Mexico. A report says that the Rocky Mountain Fuel Co., which recently increased its bond issue from $4,000,000 to $10,000,000, is negotiating for the control of the corporation.

Canada

Edmonton, Alta.—The Black Diamond Collieries Co., Ltd., which holds 4480 acres of valuable coal lands of Alberta, in which many American stockholders all over the United States are interested, was thrown into litigation last week, by the application of J. F. Povach, who asks that a receiver be appointed for the company. He states that the collieries company is now insolvent and unable to pay its current expenses.

Personals

Lewis Winters, of Centralia, has been appointed assistant division engineer of the Lehigh Valley Coal Co., at Pittston, Penn.

M. L. O'Neale has been recently appointed superintendent of the Central Coal Co.'s mines at Kimberley, Ala., retaining at the same time his former position as superintendent of the Seaboard Coal & Coke Co., at Coal City, Ala., at which latter place he will continue to make his headquarters.

James Blee, who is serving his first term as president of District 25, United Mine Workers of America, with headquarters at Moberly, Ohio, tendered his resignation, Nov. 15. Mr. Blee has been in ill health for several months and it is claimed that he is unable to attend to the business involved in this office. Vice-President Harry Beresford, of Huntsville, Mo., will fill out the unexpired term.

Construction News

Hazleton, Penn.—The Lehigh Valley Coal Co. is preparing to start a large new stripping pit between Stockton and Ashmore, four miles from here.

Philadelphia, Penn.—Jacob Meyers & Son are estimating on plans for a trestle and coal pocket at Trenton Ave. and Westmoreland St., for Owen Letters & Sons.

Scranton, Penn.—Permits have been issued to the Delaware, Lackawanna & Western R.R. Co. for the erection and construction of an addition to the Brisbin breaker, in North Scranton.

Middlesboro, Ky.—The Virginia Iron, Coal & Coke Co. is making extensive improvements of its plant at Middlesboro, Ky., and expects to have it in operation in a short time.

Lexington, Ky.—Andrew Brehm, the well known St. Marys contractor, has been awarded the contract for building the large new coaling tipple for the P. S. & N. Ry. Co., at Elbon, Elk County.

Williamson, W. Va.—The Pond Creek Coal Co., Williamson, W. Va., is installing in its Pike County, Ky., colliery, a 600-kw. Curtis turbo-generator which is being obtained from the General Electric Co.

Rices Landing, Penn.—Active work on the extension of the Pennsylvania R.R. through Rices Landing to Crucible coal mines has been started. The Crossan Construction Co., of Philadelphia, has the contract for the work.

Baltimore, Md.—A contract is now in the hands of Henry Rippel for the building of a concrete foundation for new coke ovens at Sparrows Point, by the Maryland Steel Co. The same builder is erecting a concrete blacksmith shop for the same company.

Youngstown, Ohio—The Republic Iron & Steel Co. has awarded a contract for the construction of 68 coking furnaces near the Lansingville plant. The output of these furnaces will be 1000 tons of coke a day, and the gas will be utilized at the Lansingville steel plant.

Paint Creek, W. Va.—The Paint Creek Collieries Co., Paint Creek, W. Va., is adding to the equipment of its mines three 13-ton, 42-in. gage electric mining locomotives and ten 7-ton electric gathering locomotives, all of which are of the General Electric Co. manufacture.

Wilkes-Barre, Penn.—The Delaware & Hudson R.R. will build a line on the west side of the Susquehanna River, at Wilkes-Barre, for handling coal and freight traffic. The new line will be 7 miles long and will cost about $2,000,000. It will connect with the main line at Hudson.

Indiana, Penn.—The Savan Coal Co., which recently purchased the Lowry coal and some adjoining territory near Deckers Point, has commenced the opening of the new mines. New entries are being made and everything is being put in readiness for the shipment of coal when the railroad to the field is completed.

Johnstown, Penn.—The Cambria Steel Co. has announced plans for the construction of a model mine-rescue and first-aid station at Johnstown, near the entrance of its extensive coal mines. It will place that company in a prominent position regarding the best and latest means of aiding injured and imprisoned miners in case of accident.

McRoberts, Ky.—The opening of McRoberts to freight, as well as passenger, business has had the effect of starting construction on a scale never dreamed of by the promoters of the city. The capacity of the local brick plant has been increased to 50,000 a day, and the output is being consumed. The large sawmills, planing mills and dry kilns also are being taxed to their limits.

Kansas City, Mo.—The Central Coal & Coke Co., Kansas City, Mo., is arranging for equipping its mines at Rock Springs, Wyo., with electric drive. The new machinery being installed includes two 500-kw. Curtis turbo-generators, three electric generators of 150, 250 and 300 kw., respectively, and switchboard apparatus. All of these machines are being obtained from the General Electric Co.

Winchester, Ky.—A deal was consummated at Ashland whereby R. L. Thomas and others, of Lexington, conveyed to Huntington and Bluefield, W. Va., capitalists 23,000 acres of valuable coal and timber land in Jackson County, Ky., for $15 per acre. The new owners will construct a railroad from Heidelburg, on the Louisville & Atlantic, to the heart of the tract.

Fayette City, Penn.—The construction of a battery of coke ovens has been started near Tremont mine, facing the Lake Erie tracks and the Monongahela River. The ovens are being erected by the Belle Vernon Coke Co., composed of McKeesport capitalists, for the purpose of making coke from coal taken from under a tract of land near Belle Vernon and running back to Pricedale.

Birmingham, Ala.—Including the opening of a new mine at Red Star, which will cause expenditure of about $100,000, and erection of a coal washer that will care for 1000 tons of coal a day, the Bryan Coal Corporation has made preparations for extensive development work in the near future. Immediate development of the big properties was decided upon.

Rock Springs, Wyo.—The Lyons Coal Co., Rock Springs, Wyo., is installing electric drive in the new mine being developed here. The electrical apparatus includes a 500-kw. alternating-current generator with direct-connected exciter, two 112-hp. motors, six 200-kv.a. transformers and two smaller motors of 15 and 25 hp., respectively. All the apparatus will be of the General Electric Co.'s manufacture.

Wilkes-Barre, Penn.—The Pennsylvania Coal Co. plans to build a railroad from the easterly side of the large culm dump back of Stark St. to a point known as Campbell's Grove. The line will be approximately 1100 ft. in length.

At the easterly end the company intends to build large culm pockets from which culm will be loaded into cars on the Erie tracks and taken to No. 9 washery at Hughestown.

Waynesburg, Penn.—Work on the plant of the Poland Coke Co., which is being built to develop a tract of 1100 acres in Cumberland Township, is actively under way.

The Republic Co. has recently let a contract for the erection of an initial battery of 68 Koppers byproduct ovens to be completed by the close of 1913, and it is announced that the company intends to make its own coke in the future.

Knoxville, Iowa—The Consolidated Indiana Coal Co., Chicago, Ill., is equipping its collieries at Knoxville, Iowa, with considerable new electrically driven machinery. In the power plant a 600-kw. Curtis turbo-generator unit is being installed, which will furnish power for operating a new electric hoist driven by a 300-hp. motor. In the installation are also included an air compressor and a switchboard. The General Electric Co. is supplying all the apparatus.

Whitesburg, Ky.—The Cumberland Telephone & Telegraph Co. is constructing lines along the Lexington & Eastern R.R., into the coal fields in the vicinity of Whitesburg, Ky., giving direct connection by telephone with the larger cities of the state and the outside world. The Eastern Kentucky Home Telephone Co. is also constructing a long distance line from Whitesburg into the coal fields, by way of McRoberts to Jenkins.

Bellaire, Ohio—The George M. Jones Co., of Toledo, Ohio, have started work on the development of a tract of coal, near Bellaire, Belmont County, Ohio, where it contemplates opening two mines, each with a capacity of 3000 tons per day. They are shaft mines and the equipment is to be modern, all of the buildings fireproof, shafts concrete lined, and tipples of steel with concrete floors. Contracts for the same are being let by its consulting engineers, George S. Baton & Co., Pittsburgh, Penn.

Pottsville, Penn.—In order to increase the production of anthracite upon the Schuylkill Valley branch of the Pennsylvania R.R., officials of the railroad announced today that two new big coal tracts will be opened at once.

One of them will be opened by Madeira-Hill & Co., on the Lawrence tract between Mahanoy Plane and Frackville.

The other will be opened west of Broad Mountain, near Wolfe Creek. Large new breakers will be built on these tracts and when fully developed the Pennsylvania production of anthracite will be increased many hundreds of thousands of tons annually.

Pictou, Colo.—The Colorado Fuel & Iron Co., Denver, Colo., is instaling additional apparatus for equipping its mine at Pictou, Colo., with electric drive. The installation includes a 500-kw. rotary converter, two motors of 235 hp. each, four motors of 200, 150, 100 and 65 hp., respectively and switchboard apparatus. For operating its Coal Creek mine at Carron City, Colo., new electrical hoist apparatus consisting of a 125-hp. motor-generator set, 250-hp. motor, air compressor and switchboard is being added to the power-house equipment. All the apparatus is of the General Electric Co. manufacture.

Springfield, Ill.— E. Wyatt, of Springfield, representing a New York syndicate, has closed a sale of 30,000 acres of coal rights in Macoupin County. The amount involved is said to be $600,000, cash. The property will be developed by the Eastern syndicate which took over the rights.

The seam of coal in this tract is known geologically as No. 6, averaging from 6 to 8 ft. in thickness and lying about 350 ft. from the surface. The syndicate has already made plans for sinking four new mines along the Clover Leaf, Big Four, Louisville & Nashville and Chicago & Eastern Illinois. The mines will be lined with concrete, reinforced by steel wire.

New Incorporations

Coalton, Okla.—Pleasant Valley Coal & Coke Co., of Coalton, Okla.; capital stock, $50,000.

Chicago, Ill.—The Globe Coal Co., of Chicago, has increased its capital stock from $50,000 to $250,000.

Lyndale, Ky.—The Jellico Gas Coal Co. has been incorporated by W. H., A. S. and L. R. Soper, with a capital stock of $6000.

Worthington, Ind.—The Hannum Coal Co. has been incorporated here by Frank Hannum, L. Hannum and John Barton, to mine coal.

Portland, Maine—Mining Development Co., general mining; capital, $250,000. President, S. St. F. Thaxter; treasurer, A. L. Robinson, Portland.

Cleveland, Ohio—The Little Kate Coal Co., of Cleveland, Ohio, has filed papers with the secretary of state changing its names to the Citizens Coal Co.

Memphis, Tenn.—Greenwood Semi-Anthracite Co., of Greenwood, to mine and sell coal; capital stock, $1000, all subscribed. W. A. Butterfield is president.

Galesburg, Ill.—Anderson Grain & Coal Co.; deal in grain, coal and lumber. Capital, $25,000. Incorporators are B. E. Hewitt, C. H. Anderson, F. R. Wringer.

Hazard, Ky.—The Raccoon Coal Co. has been organized at Hazard, Ky., with a capital stock of $10,000. S. D. Jones, Anna Jones and W. M. Jones are the incorporators.

Indianapolis, Ind.—The Murray Coal Co. has been incorporated with a capital stock of $3000. The directors are James D. Murray, Sara D. Murray and Vincent H. Mansfield.

Shamokin, Penn.—Application will be made Dec. 2, 1912, by Robert E. Carter, David T. Campbell and Leroy Stauffer for the charter of an intended corporation to be called the Colbert Coal Co.

Cleveland, Ohio—Articles of incorporation were recently filed for the Netta Coal Co., of Cleveland. The capital stock is $50,000, and the incorporators are R. G. Curren and others.

Lagrange, Ind.—The Indiana Mining & Development Co., of Lagrange, Ind., a $12,000 corporation, has been organized. Directors are Andrew R. Wyatt, Iris J. Vaughn and George H. Lynch.

Patricksburg, Ind.—The Rowland Block Coal & Clay Co. has been incorporated here, with $50,000 capital stock, to operate coal lands. It is an Ohio corporation. W. C. Martin, I. W. Aten and E. O. Roberts are named as directors.

Cleveland, Ohio—The Netta Coal Co., of Cleveland, Ohio, has been incorporated with a capital stock of $50,000, to mine and deal in coal. The incorporators are Howard A. Couse, T. Carleton, Charles A. Morris, Owen N. Wilcox and R. G. Curren.

Barnesville, Ohio—The Forest City Coal Co., of Barnesville, Ohio, has been incorporated with a capital stock of $5000 to mine and deal in coal. The incorporators are Michael Livingstone, A. B. Livingstone, L. L. George, Ada Reilly and S. L. Gutentag.

Centralia, Wash.—Articles of incorporation have been filed for the Washington Coal Mining Co., with a capital stock of $30,000. A. H. McCoombs and B. A. Brown, of Seattle, and J. E. Bennight, of Centralia, are the incorporators.

Christiansburg, Va.—The G. B. Kipps Anthracite Coal Co., capital stock $10,000, has been incorporated at Christiansburg, Va., with M. B. K. Linkous, president; H. M. Linkous, vice-president, and G. B. Kipps, secretary and treasurer, all of Cambria, Va.

Huntington, W. Va.—Coal & Timber Co.; to purchase and operate timber lands and to lease oil and gas lands for the purpose of operating them. Authorized capital, $5000. Incorporators are A. B. Hyman, S. J. Hyman, I. S. Hyman, James H. Strickling and G. I. Neal.

Des Moines, Iowa—The Carbon Fuel Co. filed articles of incorporation in the office of the County Recorder, Nov. 16. The concern will have a capital stock of $10,000, and the officers are president, F. D. Dole; vice-president and secretary, H. M. Shuler; treasurer, B. C. Holm.

Industrial News

Roanoke, Va.—Coal shipments from the mines on the Norfolk & Western line were 1,939,772 tons in October.

Harrisburg, Penn.—Conservation Fuel Co.; capital stock, $5000. Incorporators: B. E. Gamble, C. B. Miller, G. W. Wilmot.

Kaylor, Penn.—Indications are that the plant of the Great Lakes Trade Coal Co. will resume operations next month.

Philadelphia, Penn.—Decota Coal Co.; authorized capital, $15,000. To mine coal in Roaring Creek District, Randolph County.

Pottsville, Penn.—The Reading Co. has ordered a new opening to be made in the long abandoned Richardson colliery workings.

Lansford, Penn.—The Lehigh Coal & Navigation Co. is arranging to keep its Lehigh and Delaware division canals open as long as weather conditions permit so as to increase anthracite shipments.

Waynesburg, Penn.—E. E. Morris, of Waynesburg, has sold a tract of coal in Monongalia County, W. Va., consideration $10,000. The purchasers of the coal are Dr. F. Stahlman and others, of Charleroi.

Huntington, W. Va.—The Nord Dean Coal Co., of Michigan, acquired a lease on a 1000-acre tract of coal land in the Dingus Run district of the Guyandotte Valley field. Operations are to begin during the present week.

Baltimore, Md.—The British steamship "Harpeake" has been chartered by the Navy Department to load a full cargo of coal at Baltimore for Cavite, Philippine Islands. The cargo is to be supplied by the Consolidation Coal Co.

Princeton, Ill.—The Spring Valley Coal Co. is having installed electric light in mines Nos. 1 and 3. Current will be supplied by the Spring Valley Electric Light Co., and equipment is being installed this week.

Birmingham, Ala.—Operations of the new coal-mining slope being opened at Kimberly by the Central Coal Co. is expected to begin about the first of next year. This will mean employment for several hundred miners and day laborers.

Anderson, Ind.—The new coal dock in the Pennsylvania yards was put into operation Nov. 14. The automatic dock is a vast improvement in that it enables a fireman to fill a locomotive tender in two minutes. The dock has a capacity of 240 tons.

Big Stone Gap, Va.—It is reported that the Interstate R.R. Co. operating a road between Stonega, Roda, Appalachia and Norton, Va., and serving an important coal-producing region, has purchased the Wise Terminal, a six-mile road from Norton to Glamorgan.

Johnstown, Penn.—By a deal closed, Nov. 19, 850 acres of coal land were acquired by the Manor Real Estate & Trust Co., of Philadelphia, near Bethel. The price is given as $105,000. The tract adjoins a 9000-acre tract recently taken by the Manor company.

Canton, Ill.—No. 3 mine of the Star Coal Co., commonly known as Sunny Side, has commenced work again after a two-weeks' idleness, caused by the burning of the engine room. A new engine house of concrete blocks has been erected and a new hoisting engine installed.

Duquoin, Ill.—Preliminary negotiations for a transfer of 35,000 acres of rich coal lands in the east portion of Williamson County, southeast of this city, have been completed by Chicago capitalists. It is generally understood that the New York Central and the Big Four R.R. are behind the project.

Somerset, Penn.—Daniel Saylor, of Jenner Township, last week sold the coal underlying his 207-acre farm to the United Coal Co. for $100 per acre. Charles George sold 61 acres to the same company at the same time. The United company is planning to make several new openings in its Jenner field before spring.

Ashville, Penn.—The Altoona Coal & Coke Co., which has two mines not far from here, expects to charge 100 coke ovens that have been idle for two years. The ovens will be put in operation as soon as repairs are completed, probably by the first of the year. Only six ovens are burning at the present time, and 300 men are employed.

Ebensburg, Penn.—A coal deal involving 2263 acres and representing a transfer of almost $300,000, was recently consummated in Cambria Township. It is stated that coal will be mined through a shaft on the Clau pike, about 3 miles from here, on the W. R. Williams farm.

Shipments will be made over a spur to the P. R.R. from Beulah.

Monessen, Penn.—Another important coal deal has been consummated, a tract of 55 acres being purchased for $60,000 from George D. Thompson, of Brownsville, by Holmes A. Davis and J. H. Hillman, both of Pittsburgh. The last mentioned are the owners of the Marion Coal & Coke Co. It is the intention of the new owners to develop the coal at once.

Connellsville, Penn.—It is estimated that within one year 900 coke ovens in this district wil go out of business, and that within three years nearly 3300 ovens will have exhausted their supply of coal, reducing the annual tonnage of the region about 2,300,000 tons. Manufacturers are looking to the Greene County Field to come to the rescue.

Connellsville, Penn.—A large deal was consummated last week, whereby 75 acres of land along the Monongahela R.R., between Alicia and Maxwell, became the property of a new corporation known as the Luzerne Coal & Coke Co. It is the intention of the new owners to begin immediate preparations for the erection of 40 ovens. Eighty men will be employed.

Ione, Wash.—The Idaho & Washington Northern R.R. Co. has sent W. C. Smith into the Pend d'Oreille country to hunt for coal deposits which they believe are there. The coal, if any is found, will be deep, as only one outcropping is known to exist, and that has been used by an old trapper who lives about six miles west of Ione. If the coal is found it is the intention of the company to file, and work it for their own use.

Trinidad, Colo.—The Forbes mine, the largest producing property of the Chicosa Fuel Co., located 18 miles north of here, has been purchased by the Rocky Mountain Fuel Co. Consideration, $150,000. The transfer takes effect Dec. 1.

The Forbes mine has been in operation for 10 years and its output is 1000 tons per day. This purchase gives the Rocky Mountain Fuel Co. three active properties in Las Animas County.

Jackson, Ky.—President Jere H. Wheelwright, of the Consolidation Coal Co. announced recently that the Louisville & Nashville R.R. has completed the extension of its line from Jackson to McRoberts, Ky., and that coal shipments from the company's mines in the Elkhorn Valley will begin immediately. The central power plant, which the coal company has built to furnish electric power for the operation of all its mines in Kentucky, will be ready for operation about Dec. 15.

Providence, Ky.—The Webster Coal Co.'s mining property located within the city limits of Providence, and directly on the Louisville & Nashville R.R., has been purchased by Ruckman Bros., extensive operators in this section. The price paid is said to have been $100,000, and, in addition to the mine, 1000 acres of coal rights are said to have been included. A new company will be formed to be known as the Clear Creek Coal Co.

Whitesburg, Ky.—A deal for 5000 acres of coal lands lying along the Letcher-Perry County border, touching the Lexington & Eastern road, has just been concluded by which a syndicate composed of Baltimore and New York capitalists becomes the owner of the property. The purchasers say that no time will be lost in beginning developments and that a million dollars will be expended in getting the property in o shape, if necessary.

Chattanooga, Tenn.—The property of the Chattanooga Iron & Coal Co. was sold under a decree of the federal court, Nov. 15, to A. W. Chambliss, representing the bondholders' reorganization committee and the Equitable Trust Co., of New York, for $500,000. This property includes extensive coal mines, coal and timber lands at Dunlap, a large blast furnaces in this city, the iron mines at Estell, Ga., and the limestone quarries at Ironco, Ga.

Frankfort, Ky.—The Biggstaff Cannel Coal Co. has been reorganized at Mt. Sterling, with Ralph R. Wilson, of Frankfort, as president and J. Clay Cooper, secretary-treasurer and general manager. The company owns over 700 acres on the O. & D. railroad and has begun the development of the property, opening up mines. Extensive operations will begin in the spring and a hundred miners put to work. The property is valued at $500,000.

Whitesburg, Ky.—Announcement is made here to the effect that the Slemp interests of Big Stone Gap, Va., which own from 30,000 to 40,000 acres of rich coal and timber lands in the country bordering the new line of the Lexington & Eastern R.R., will begin at once the development of their property on a large scale. Mr. Slemp has voluntarily decided to retire from Congress, March 4, next, that he may be able to give all his attention to his coal property.

Birmingham, Ala.—The Bessemer Coal, Iron & Land Co., of Birmingham, Ala., has purchased from William H. Skaggs, of Chicago, 2800 of the 42,000 acres of coal land held by him in Tuscaloosa and Fayette Counties, Alabama, and have taken an interest with Mr. Skaggs in the balance of his holdings. This whole tract has been prospected with a diamond drill and is all underlaid with what is known as the Corona coal seam from 4 to 6 ft. thick, at a depth below the surface of from 400 to 700 ft. There is also another seam of coal outcropping in the hills from 34 to 44 in. thick, which underlies about 25,000 acres of the tract.

The North River penetrates the center of this tract, and a railroad company known as the Gulf & Northwestern has been organized, of which Mr. Skaggs is president, and has surveyed a route for a railroad following the North River Valley, from Tuscaloosa, crossing the Southern Ry., at Berry on the north edge of the tract, and connecting with the Frisco and Illinois Central roads at Natural Bridge, near Haleyville.

The Bessemer Coal, Iron & Land Co. will shortly open a mine on the portion purchased by them.

This is the largest unbroken and undeveloped tract of coal land known to exist in the state and not held by one of the larger companies.

Coal Trade Reviews

Current Prices of Coal and Coke and Market Conditions in the Important Centers

General Review

The comparatively mild weather, prevailing in all parts of the country, has materially relieved what might have otherwise been an acute situation in hard-coal. Now that Lake navigation is closed, heavy tonnages will be diverted into the districts where premium coal prevails, and the results will be watched with interest. Stocks in the hands of the dealers are probably shorter than they will admit to anyone, except the producer.

At New York the soft-coal market continues to harden quite perceptibly, but at outside points there were some indications of an easing off during the week; while prices are firm, there is only an uneven and spasmodic demand, and it is doubtful if the market could absorb a heavy production. Were it not for the car shortage, there would probably be a falling off in the prevailing abnormal quotations.

Lake shipments from the Pittsburgh district closed during the current week. With the exception of slack, there is no free coal for prompt shipment, but the demand is likewise limited. The warm weather has materially relieved the situation in Ohio. Production has improved somewhat, and the market continues strong with prices decidedly in favor of the producers.

The number of vessels awaiting cargoes at Hampton Roads has fallen off considerably below last week. Favorable weather conditions have tended to lessen the anxiety of the domestic consumers in the South, but the same uneasiness prevails with the steam users and some plants have been compelled to close down because of the lack of sufficient supplies.

The warm weather resulted in a break in the Middlewestern market, which is now easy and showing a tendency to fall off still further. The open winter in the Rocky Mountain region has enabled the railroads to handle the traffic to the best possible advantage, and the situation is about normal.

Boston, Mass.

Bituminous prices are firm and yet there is nothing more than an uneven and spasmodic demand; any volume of coal for distribution inland would be found hard to absorb. Buyers are waiting developments and those under contract, who are much in the majority, are hoping for better shipments "when the Lakes close." Meanwhile, every week sees demurrage charges piling up on vessels waiting at Hampton Roads and Baltimore and stocks at this end more rapidly depleted with the advancing season. It has to be said of New England generally that storage among mills and other corporations is larger than formerly and that consumers are therefore able to be more forehanded than was their practice.

Coal from the Pennsylvania districts is without material change. The movement all-rail is slow and fitful, so far as new business goes. On contract shipments so far are fairly regular. The Georges Creek supply is being sent almost exclusively to Baltimore to clear waiting bottoms, for the government and for Eastern consignees. The select grades from Cambria and Somerset Counties are practically out of the current market.

There is really no news in anthracite. Every retailer is running closer to the wind than he will admit to any but his friends at the sources of supply. Stove coal is practically out of consideration now in most places; the proportion in each shipment is extremely small, if, indeed, there is any at all.

Current wholesale quotations are about as follows:

Clearfields, f.o.b. mine	$1.45@1.80
Clearfields, f.o.b. Philadelphia	2.70@3.05
Somersets, Cambrias, f.o.b. mine	1.65@2.00
Somersets, Cambrias, f.o.b. Philadelphia	2.90@3.25
Pocahontas, New River f.o.b. Hampton Roads	3.35@3.50
Pocahontas, New River on cars Providence	4.50@4.75
Pocahontas, New River on cars Boston	4.50@4.75
Anthracite, egg and stove, f.o.b. New York	5.20@7.00
Anthracite, chestnut, f.o.b. New York	5.45@7.00

New York

Anthracite—The comparatively mild weather, which has been prevailing throughout the East, has been a great benefit to the hard-coal trade. While the demand continues persistent, it has not shown the characteristic urgency, incident to a short supply at this period of the year.

Shipments to the Lake trade are now definitely concluded, and it remains to be seen if the expected relief at other centers will materialize. There will undoubtedly be an increase in the tonnages into the large Eastern points, but it is doubtful if they will be sufficient to materially affect the situation.

The steam grades are a marked drug on the market, but the domestics show no indication of weakening. Prices of the latter have advanced slightly, and we now quote the market as follows:

	Upper Ports	Lower Ports
Broken	$5.00	$5.25
Egg	5.25	6.25 @ 6.75
Stove	5.25	6.75 @ 7.00
Nut	5.50	6.50 @ 6.75
Pea	3.50	3.50
Buckwheat	2.75	2.10 @ 2.70
Rice	2.25	1.85 @ 1.95
Barley	1.75	1.25 @ 1.70

Bituminous—The warm weather has also tended to relieve what might otherwise now be an acute situation in soft coal. The demand has been unusually persistent, and stocks in the hands of both consumers and wholesalers are believed to be at a remarkably low point. There is a steady and persistent demand on contracts, and the market is firm in every department. One of the features of the trade is the heavy buying on the part of the railroads, and at good figures, too. The shortage of labor and cars at the mines is still curtailing production, and the movement is only about fair.

Prices continue to advance, and it is safe to say that nothing could be obtained in the New York market under $3.20. We quote the prevailing market about as follows:

West Virginia, steam	$3.20@3.25
Ordinary grades, Pennsylvania	3.20@3.25
Fair grades, Pennsylvania	3.20@3.25
Good grades, Pennsylvania	3.25@3.30
Best Miller, Pennsylvania	3.25@3.30
Georges Creek	3.50

Pittsburgh, Penn.

Bituminous—The last shipments of coal from the Pittsburgh district for movement up the Lakes were made Wednesday, Nov. 27. There is a fair supply of cars, though on the whole it has been decidedly bad on most divisions during the past fortnight.

There is hardly any free coal, outside of slack, available for prompt shipment, but demand is likewise limited. Slack is quotable at $1.10 for prompt shipment, but buyers could not do this price over the next few months since the supply will become limited upon the termination of the Lake movement, and the usual quotation for regular shipments over the next few months is $1.25. Circular prices have been evened up, operators who

early quoted on the basis of $1.25 for mine-run having withdrawn this in favor of the $1.30 basis later announced by the Pittsburgh Coal Co., and this is now the market on contracts for a year. We quote circular prices as follows: Slack, 90c.; nut and slack, $1.05; nut, $1.25; mine-run, $1.30; ¾-in., $1.40; 1¼-in., $1.55, per ton at mine, Pittsburgh district.

Connellsville Coke—The market has been quieter as regards prompt coke in the past few days, and prices have suffered somewhat, sales of prompt furnace being made at $3.90 and possibly $3.80, when the minimum for a fortnight or more had been $4. On the other hand sales for regular delivery over the month of December have been made at somewhat higher prices, sellers being unwilling to cover the period of poor shipments around the holidays except at a premium, and as high as $4.25 and $4.35 is understood to have been paid for shipments over the whole month. Two or three additional contracts have been made for furnace coke over first half at $3.25 and $3.50, there being considerable variation on account of grade. Foundry coke is quotable at but little over furnace coke. We quote: Prompt furnace, $3.90@4; December furnace, $4@4.25; contract furnace, first half $3.25@3.50; contract furnace, year, $3@3.25; prompt foundry, $4@4.50; contract foundry, $3.50@4.

Production for the Connellsville region is given under "Production and Transportation Statistics."

Baltimore, Md.

Notwithstanding a slight easing off in tidewater business, the general activity in this market is just as pronounced as it has been for the past month or more; the slow demand at tidewater is due to the nonarrival of vessels which were expected and for which the operators had forwarded coal in large quantities. As a result, several thousand tons were left on the hands of the local companies. Owing to the brisk demand from other sources, however, the trade experienced no trouble whatever in disposing of their stock, and this, too, without any weakening in prices. Quotations on all descriptions continue firm, with low grades bringing $1.60 or better.

The car supply in the West Virginia fields was by no means good during the week, and it is reported that some of the companies were forced to shut down their mines temporarily. The labor situation is also still an obstacle in the path of normal mining operations. During the past two or three weeks more miners have been obtainable, but there are several companies that are still short.

The mild weather which prevailed the greater part of the week did not seriously interfere with the anthracite trade.

Buffalo, N. Y.

There is some report of a surplus of bituminous coal now, and but for the car shortage there would probably be a slump in prices, which are abnormally high. Still there is no prospect of cars becoming more plentiful and it is probable that prices will hold. Reports from the trade down the state are to the effect that buying is more cautious and top prices are no longer obtained.

In some districts there are no cars at all for days and 50 per cent. of capacity is a large average almost anywhere. In some of the mines the men are also getting discouraged, and are scattering in search of steady employment. The price of bituminous is now about 40c. a ton more than it was a year ago, so the trade can afford to stand some drawback, especially as the actual output is much more than it was then.

Some jobbers insist on considerable advance in quotations of bituminous, but the trade in general adheres to: $3.20 for Pittsburgh lump, $3.10 for three-quarter, $3 for mine-run and $2.75 for slack. There is still great scarcity in all grades of coke, prices being quoted at $6.50 for best Connellsville foundry.

The anthracite trade is without change, but it is confidently predicted by shippers that the large premiums enjoyed for sometime by the independent interests are about at an end. With the closing of the Lakes a matter of 200,000 tons a week will be diverted by the big companies into the territory most easily reached by the independents. This will also have its effect on the anthracite trade generally, but the shortage is still too great to be met all at once. The trade as a whole will not be easy till next summer. Shipments of anthracite by lake for the week are 131,000 tons. Most shippers will drop the lake trade soon after Dec. 1.

Columbus, Ohio

Warm weather which prevailed during the last week has helped relieve the shortage considerably, and the operators are still doing everything in their power to meet the demand. Orders are still piling up to some extent and the market is strong with prices in favor of the producers. Coal men say, however, that the profit is smaller, taking into consideration the existing high prices, than when coal is selling at a low margin and operations are not restricted.

Quotations have not changed much and there is a good demand for steam grades as well as the domestic. The car supply is growing worse and if cold weather sets in considerable stress is looked for. Manufacturers are anxious for deliveries but the dealers are only taking what they can actually rid themselves of, being satisfied to wait until prices drop before stocking up.

Production in the Ohio fields has improved somewhat over last week. The Hocking Valley district reports 60 to 75 per cent. of normal, but in the Pomeroy Bend the production remains about the same as the previous week.

The Ohio Public Service Commission and traffic officials have succeeded somewhat in relieving the car situation. Railroads are using all of the coal that they are able to get hold of.

Quotations in Ohio fields are:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump	$2.25		$2.35	$2.25
¾-in.	2.00	$1.60	2.00	2.00
Nut	1.50		2.00	
Mine-run	1.75	1.50	1.75	1.75
Nut, pea and slack	1.00		1.25	1.10
Coarse slack	1.00	1.25	1.00	1.00

Hampton Roads, Va.

A slight change for the better could be noticed at Hampton Roads during the past week. The number of vessels awaiting coal have been somewhat diminished and with heavy production at the mines from now on, there are good prospects of loading more coal here during the coming week than has been handled any other two weeks during the month. There do not seem to be any shippers willing to take on outside tonnage, all their efforts being brought to bear on contract business.

Local railroads are resorting to various means to keep their equipment on or near their own lines, and strong embargo has been placed against the Northwest. To date this month the tonnage dumped at Hampton Roads is approximately 100,000 tons less than that for the same period during October, which is not bad in view of the unfavorable mining conditions during the early part of the month. The recent advance in quotations has caused considerable protest.

Louisville, Ky.

The continued and somewhat unusual mildness of the weather in this section still tends to counteract, to a certain extent, the scanty receipts. There is as yet no noticeable improvement in the car situation, which, as before, is particularly bad in the western Kentucky district, served almost entirely by the Illinois Central R.R.

Western Kentucky pea and slack is accordingly quoted as high as 80c., and there is a very good demand for screenings of all sorts. In the eastern Kentucky and Tennessee fields the car shortage is also unrelieved, not more than a 50 per cent. supply being received for loading. Nearly all operators are booked up for several months ahead. Such quotations as are available are about as follows: Block, $2.50; block and lump, $2.25; round, $2; run-of-mine, $1.35; nut and slack, 80 cents.

Knoxville, Tenn.

Operators in the Kentucky-Tennessee field have more business than cars with which to take care of it. The local demand is excellent and the operators having connections in the Northwest are doing a fine business at highly satisfactory prices. The conditions in the Northwest relieves local competition and boosts the Southern market. Even steam coal, which has been a drag all summer and fall is getting to be a strong factor and no complaints are heard as to demand or price.

It is charged that southern railroads are confiscating coal, anticipating a greater shortage of cars. Sales of domestic from this field have been made in the Northwest at $2.50 per ton, with delivery running through several months.

Birmingham, Ala.

The weather during the past week was unusually warm and this condition seemed to lessen the concern of the domestic dealers to some extent, but the same uneasy feeling prevails with the shippers and consumers of steam coal.

The chief cause of this trouble is due more to the slow way in which cars are handled than to the limited supply. In many instances it requires from two to four days to get loaded coal cars through the Birmingham terminals. Insufficient equipment and lack of system both contribute largely to our present car shortage, and there is hardly any reason to hope for relief before next spring.

Owing to the brisk demand for domestic coke, some of the larger producers are putting in screens and the quantity of nut coke for the market will be greatly increased during the next 30 days.

Indianapolis, Ind.

The coal situation in Indiana has changed but little in the week. The car shortage continues unrelieved. The railroads have shoved more cars to the mines, principally hoppers, but have done no better in getting them away to their destination; cars started off Nov. 14 have not yet been received. Some little headway has been made during the mild weather in getting steam users filled up, while domestic consumption was slow, but operators say a cold spell will cause as bad a situation as ever.

Prices are unchanged and the market continues as follows:

No. 4 mine-run	$1.25
Nos. 5 and 6 mine-run	1.15
No 4 steam lump, 1½-in	1.50
Nut, No. 4	1.60
Egg	1.60
Domestic lump 2½-in	1.85
Domestic lump 5- and 6-in	2.00
Screenings, No. 4	0.95
Screenings No. 5 and 6	0.85
Washed coal, Nos. 1 and 2	2.00
Brazil block	2.60

Chicago

Warmer weather has resulted in a break of from 25 to 40c. a ton in coal prices. Most dealers have stopped buying and a few have canceled orders. A large number of companies are sold up for three or four weeks which prevented an even more serious slump.

The market is inclined to be soft and it is expected that sharp maneuvering will be necessary in order to prevent a further break in prices. Smokeless mine-run is firm at $1.40@1.50, but the prepared coal does not rise above $2.50. The highest price on Franklin County coal is $2.25 and there has been a drop in the price of Springfield from $2 to $1.85. With the prospect that there would be a falling off in orders for lump coal, thereby causing a reduction in the output of screenings, the market for the latter has been boosted about 10c. a ton.

Prevailing prices at Chicago are:

	Sullivan Co.	Springfield	Clinton	West Va.
4-in. lump	$2.72			
Domestic lump		$2.57	$2.72	
Egg	2.72			$3.55
Steam lump		2.12	2.27	
Mine-run	2.07@2.17	1.97	2.17	3.55
Screenings	1.62@1.67	1.57	1.52	

Coke—Prices asked for coke are: Connellsville, $6.75@7; Wise County, $6.75@7; byproduct, egg and stove, $5.75@6; byproduct, nut, $5.75@6; gas house, $6.

Detroit, Mich.

Bituminous—The situation is modifying quite rapidly, which is quite unusual for this time of the year. There seems to be plenty of coal coming into Detroit, and has been for the past week. It is the opinion of several operators that the situation will improve from now on, since Lake navigation is practically over, and all-rail shipments from the East and South will begin to increase in tonnage. This will have a tendency to bring the prices on bituminous coals down to normal.

The following prices prevail in this market:

	W.Va. Splint	Gas	Pocahontas	Jelico	Cambria
Domestic lump and egg	$1.75		$2.75	$1.65	
¾ lump	1.50	$1.50		1.40	$1.50
Mine-run	1.25	1.25	1.75	1.20	1.25
Slack	1.10	1.10	1.50	1.10	1.15

Anthracite—It is predicted that with the close of Lake navigation Detroit may be benefited very much. At the present time this kind of fuel is much easier than it has been, owing to the fact that there is a decided let-up in the demand. Egg is being quoted at $5.10, f.o.b. the mine. This price is above the circular and consequently the demand has fallen off.

Coke—Prices remain firm and the demand is unusually heavy, mostly for domestic purposes. There seems to be much of this kind of fuel coming in at the present time, and no one appears to be suffering for the lack of it.

St. Louis, Mo.

The gradual weakening of the Carterville market has about ceased, for with every prospect of some real winter weather now, the car-shortage question looms up as an important factor. Unloading will also be hampered some. Even without any great demand, these things alone will have a tendency to keep the price up, and there is no immediate danger of an unusual demand until after the holidays.

The car shortage on the Illinois Central limits the mines on that road to about two days a week. The Iron Mountain mines manage to get in about three days per week, and the same applies to the 'Frisco.

The prevailing market is:

Carterville and Franklin County	
Lump and egg	$1.60@1.85
No. 1 nut	1.50@1.60
Screenings	0.75@0.85
Mine-run	1.20@1.30
No. 1 washed	1.90@2.00
No. 2 washed	1.40@1.50
No. 3 washed	1.20@1.30
No. 4 washed	1.10@1.15
No. 5 washed	0.75@0.80
Big Muddy	
Lump and egg	$2.25
Breese Trenton	
Lump and egg	$2.40
Mount Olive	
6-in. lump	$1.50@1.60
3-in. lump	1.35@1.40
Standard	
6-in. lump	$1.25@1.30
2-in. lump	1.00@1.10
Screenings	0.45@0.50

Ogden, Utah

Car shortage along the Idaho lines of the Oregon Short Line is practically a thing of the past for this season. The tracks and sidings have been practically cleared and trains are moving on schedule and without interruptions. This condition is also general on the lines of the Union Pacific and the Denver & Rio Grande R.R.

This general clearing up of the railroads has released sufficient equipment to keep all the mines in Utah and Wyoming running full time and at present the larger producers are looking for some winter weather to stimulate trade, as they are catching up rapidly on their unfilled orders, especially the nut grade.

At present there is a slight over-production of nut and if present weather conditions prevail there will soon be a surplus. Anticipation of such caused this grade to drop in Nebraska. Quotations for this territory are: Lump, $2.75; nut, $2.25; mine-run, $1.85; slack, $1.

While the mines are receiving sufficient empties, they have not been able to mine their full tonnage, due to the labor shortage. This condition is probably most serious at Rock Springs, Wyo., where every mine has a large number of rooms and working faces idle, due to shortage of miners.

With the exception of Nebraska, prices are firm over the entire West and will probably remain so unless the present mild weather prevails for some time.

General quotations are as follows:

	Wyoming	Utah
Lump	$2.75	$2.75
Nut	2.25	2.25
Mine-run	1.85	1.85
Slack	1.00	1.00

The large cement plant of the Union Portland Cement Co., situated at Devils Slide, Utah, has shut down for the winter. This will have some effect on the coal market, as they consumed approximately 10,000 tons of slack per month.

Spokane, Wash.

Since the first of November, the price of fuel in Spokane has been steadily advancing, and the climax came last week when from 25 to 50c. a ton was added. The Bear Creek mines have requested the dealers to add 50c., which brings their product up to $8.50 for more than two tons, and $8.75 for a single ton. Owl Creek is selling $9@9.25. Many of the miners have added 25c. per ton to the dealers, but they in turn have not made any advance.

The prevailing prices now, as compared with six months ago are as follows:

	June	November
Rock Springs, (Wyoming)	$9.00	$9.50
Roslyn Steam (Washington)	6.25	6.50
Bellview Steam, (Canada)	6.25	6.25
Bellview Furnace, (Canada)	8.25	8.25
Owl Creek, (Wyoming)	9.00	9.25
Carney, (Wyoming)	8.25	8.25
Roundup, (Montana)	8.00	8.50
Bear Creek, (Montana)	8.00	8.50
Hill Crest, (Canada)	6.25	6.25
Smith, (Montana)	8.25	8.50
Golt, (Montana)	8.25	8.50

Continuous rains have made the country roads hard to travel, and this, with the car shortage, has been the cause of the advance. Local dealers state that should we experience a cold snap, prices will go soaring, but with continued mild weather, until Dec. 1, we can pull through the winter with few changes in the prices. Relief has been promised by the railroads by the first of December.

Portland, Ore.

The main trouble with the coal dealers here is the car shortage, which causes more or less trouble in getting deliveries from the East; however, there is no lack of fuel. The weather continues mild and the call for domestic coal has been rather light so far this fall. Prices remain as before, ranging from $7 to $10.50 per ton. Since no Australian coal is being imported this season, dealers in that grade expect to clean up well before next spring. Last year the imports exceeded the requirements by large quantities and since then the demand has decreased considerably on account of the rapid introduction of fuel oil.

San Francisco, Calif.

The importation of foreign coal for month of October was very light, totaling only 9729 tons, of which 7479 came from Australia and one cargo of Wellington, amounting to 2250 tons, from British Columbia; the other receipts were 12,285 tons of Pocahontas for the U. S. Government and 3159 tons of steam coal from Seattle for the Pacific Coast Co. steamers.

With the exception of one or two days' rainy weather, there has been no change in the climatic conditions; it has been indeed an exceptionally fine Fall, and the demand for coal has been limited to actual domestic needs, consequently the retailer has had a hard time of it.

Prices to the trade are as follows per short ton:

Wellington (British Columbia)	8.00
Pelam Main (Australia)	8.00
Cumberland	12.50
Rocky Mountain	8.00

Production and Transportation Statistics

Sault Ste. Marie Canals

Coal movement through Sault Ste. Marie Canals for the season to Nov. 1, as compared with the same period last year, in short tons:

	1911	1912	Change
Anthracite	1,769,567	1,682,355	87,212
Bituminous	11,894,878	10,937,049	957,829
Total	13,664,445	12,619,404	1,045,041

Pennsylvania Railroad

Statement of coal and coke carried on the P. R. R. Co's lines east of Pittsburgh and Erie during October and the first 10 months, with the increase or decrease over the same period last year, in short tons:

	October	10 Months	Difference
Anthracite	970,880	8,358,717	−1,222,340
Bituminous	4,113,550	38,227,609	+3,676,014
Coke	1,211,620	10,882,963	+2,068,314
Total	6,296,050	57,469,289	+4,521,988

Various Railroads

The following is a comparative statement of the fuel movement over various railroads, for the nine months ending September, 1911-12:

Railroads	1911	1912
Baltimore & Ohio[2]	25,385,086	29,975,471
Buffalo, Rochester & Pittsb.[3]	5,997,738	6,399,400
Buffalo & Susquehanna[3]	1,429,985	1,287,409
Chesapeake & Ohio[3 4]	10,452,464	.....
Erie[4]	5,374,042	4,932,131
Hunt'g. & Broad Top Mt.[2 3]	815,400	882,626
N. Y. Central & Hudson River[3]	5,918,423	5,918,884
Norfolk & Western[2 3]	15,113,959	18,176,028
Penn. (East of Pittsb. & Erie)[3 5]	46,874,400	51,173,239
Pittsburgh & Lake Erie[2 5]	11,897,848	12,953,870
Pittsb., Shawmut & Northern[3]	1,054,039	1,406,039
Southern[4]	2,474,885	2,764,689
Virginian[2 3]	1,975,659	2,611,602
Western Maryland	1,963,660	2,166,429

[1]Figures throughout this table have been reduced to a uniform basis of short tons.
[2]Includes coal received from connecting lines.
[3]Includes company's coal.
[4]August and eight months' figures.
[5]Does not include company's coal hauled free.

Connellsville Coke

The *Courier* reports production in the Connellsville region as follows:

Production	Week Ending Nov. 16	Nov. 23	Nov. 30
Connellsville	210,000	218,628	221,343
Lower Connellsville	189,142	181,990	183,309
Total	399,142	400,618	404,652
Shipments To	Cars	Cars	Cars
Pittsburgh	4,085	4,059	4,126
West of Pittsburgh	6,755	6,728	6,989
East of Region	923	1,010	880
Total	11,763	11,797	11,995

Norfolk & Western Ry.

The following is a statement of tonnages shipped over this road from mines in West Virginia and the commercial and company coal, for the month of October, in short tons:

Field	Tipple Coal	Total Coal	Commercial	Company
Pocahontas	17,881	1,216,961	1,175,320	114,418
Tug River	5,749	194,611	158,483	36,128
Thacker	1,720	230,991	175,702	55,289
Kenova	7,928	84,777	75,175	9,602
Clinch Valley	....	.....	129,844	9,811
	33,278	1,727,340	1,714,524	225,248

Foreign Markets

Russia

The following is a comparative statement of the coal production in Russia for the first six months of this year and last year:

		1912 Tons	1911 Tons
Donetz	Coal	8,827,000	8,004,000
	Anthracite	1,617,000	1,277,000
Poland	Coal	3,001,000	2,763,000
	Lignite	77,000	64,000
Ural		396,000	240,000
Moscow		91,000	79,000
Caucasus		32,000	22,000
Total		14,041,000	12,499,000

British Exports

The following is a comparative statement of the British exports for October of the current year and the first ten months of 1911-12:

	October	Ten Months 1911	1912
Anthracite	278,321	1,984,480	2,048,811
Steam	4,989,452	38,831,231	37,799,653
Gas	1,017,126	8,672,664	8,772,149
Household	195,014	1,258,758	1,341,407
Other sorts	319,855	2,510,317	2,588,171
Totals	6,799,768	53,257,450	52,550,191
Coke	122,298	837,891	803,011
Patent Fuel	136,376	1,347,495	1,252,007
Coal, Coke, & Pat. Fuel	7,058,442	55,442,836	54,605,209
Bunker Coal	1,818,431	16,017,616	15,020,522

Nov. 15—Shipments are heavy, and there is some difficulty in securing tips. Prices for large coal are steady for prompt loading. There is a good demand for forward shipment, and quotations are on a strong basis. Today's quotations are approximately as follows:

Best Welsh steams	$4.08@4.14
Best seconds	3.96@4.02
Seconds	3.84@3.90
Best dry coals	4.08
Best Monmouthshires	3.66@3.72
Seconds	3.48@3.52
Best Cardiff smalls	2.52@2.64
Seconds	2.46@2.58

The prices for Cardiff coals are f.o.b. Cardiff, Penarth, or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both exclusive of wharfage, and for cash in thirty days, less 2½%.

Financial Department

Annual Reports, Notes and Comments on the Various Coal Securities

St. Louis Rocky Mountain & Pacific Co.

The following is a summary of the report of First Vice-President and General Manager J. van Houten, for the fiscal year ended June 30, 1912, issued under date of Sept. 3:

Results—The markets for fuel in the territory immediately tributary to your mines showed some improvement over the previous year, particularly as to coal for domestic use, and shipments of this fuel covered considerable new territory in Nebraska, Kansas, Oklahoma and Texas. The demand for coke, however, continued light, and the war in Mexico caused almost complete suspension of shipments of coal and coke to that country last year.

The decrease in annual surplus earnings (from $27,466 to $116,021) was occasioned partly by the curtailment of shipments to Mexico on account of the war and decrease in sales of coke; by the extra cost of coal produced at Sugarite mine during the period of development, which was charged to operating expenses instead of to improvement account, and by the cost of replacing ties and wooden bridges put in seven years ago, which cost was also charged to operating expenses for the fiscal year instead of being distributed over the seven years. There have also been considerable amounts expended in development work in the mines at Gardiner, Brilliant, Van Houten and Koehler, and charged to operating expenses, which will serve to increase net earnings in subsequent years.

Outlook—The higher price of copper which has now been maintained for some months has caused a marked revival of the mining industry in New Mexico and Arizona, and the demand for coke is improving. There has also been a steady increase in sales of coal and coke to sugar factories, and of coal for use at pumping plants or towns and irrigation works.

The most encouraging feature of the fuel situation for this company, however, is the gradual but sure tightening of the lines in the oil business. During the last few months there has developed a marked determination on the part of the large oil producers to discourage the use of crude oil as fuel, and it is apparent that railways and other large consumers must go back to coal.

The condition of all your properties is all that could be desired. The continued regularity and thickness of the coal veins are very gratifying. Development work has been pushed far ahead of production and the combined capacity of the five mining camps will enable the company to produce 8000 tons of coal daily and 200,000 tons of coke annually for an indefinite time without further outlay for equipment. Everything is in readiness to take care of the increased demand for fuel which may be expected from the changing conditions now in progress.

There are good reasons for anticipating a substantial increase in railway earnings for the current year. The fine crops of grain, alfalfa and fruit all over Colfax and Union Counties, and the increased acreage of land under cultivation along the line of the railway promise increased freight traffic.

During the year an irrigation dam, costing about $200,000, has been completed, which will bring under irrigation several thousand acres of land near Meloche on St. L. R. M. & P. Ry., and there are two other irrigation enterprises being developed in our railway territory which should add considerably to the business of the railway.

INCOME ACCOUNT FOR YEARS ENDING JUNE 30

	1911-12	1910-11	1909-10
Gross revenue	$1,910,908	$2,098,623	$1,974,244
Cost, expenses and taxes	1,304,819	1,382,125	1,306,733
Net income	$606,089	$716,498	$667,511
Interest charges	$388,368	$372,168	$391,045
Other deductions		14,952	10,071
Reserved for depreciation and renewals	101,700	101,912	64,767
Surplus	$116,021	$227,466	$201,628

CONSOLIDATED BALANCE SHEET JUNE 30

	1912	1911
Assets		
Property and equipment (cost)	$19,087,933	$18,773,703
Other investments	317,269	300,341
First mtge. bonds owned	.....	482,000
Cash	434,736	290,124
Accounts receivable	176,407	246,531
Coal and coke on hand	20,563	17,527
Sundry accounts	7,431	8,818
Materials and supplies	111,858	115,345
Other assets	.....	3,750
Total	$20,156,197	$20,238,139
	1912	1911
Liabilities—		
St. L.R.M.&P. Co.—		
Common stock	$10,000,000	$10,000,000
Preferred stock	1,000,000	1,000,000
First mortgage bonds	7,448,000	7,487,000
Second coupon notes	.....	251,000
Vouchers and wages	10,000	119,706
Notes payable		.....
Accounts payable, etc	133,856	5,681
Accrued interest, etc	187,185	179,810
Sundry accounts	938	2,452
Reserved for depreciation	460,326	378,919
Surplus	915,892	813,571
Total	$20,156,197	$20,238,139

St. Louis Rocky Mountain & Pacific Ry. Co. guarantees principal ($80,000) and interest on first mortgage 7%, 10-year gold bonds of Cimarron & Northwest Ry. This guaranty is secured by first lien on 22 miles of standard-gauge railroad, etc.

Reduction of Liabilities—In April, 1912, the company paid off the last of its coupon gold notes amounting to $251,000, and has now no floating debt. From the 3c. per ton set aside on all coal mined the trustee has retired $39,000 bonds during the year.

Sugarite Mine—This mine has been opened and equipped during the year and has been practically on an operative basis for the last five months of the fiscal year. The results, as well as at the new mine at Gardiner, have been entirely satisfactory, both as to thickness and regularity of coal veins and quality of coal. The Sugarite mine particularly produces a fine domestic and steam coal, which has now been thoroughly tested on the market and is being sold as far east as the Omaha district in Nebraska, where it is in good demand. The equipment of this mine will be fully completed within the next 60 days and the entry development has been pushed so that its capacity for the fall and winter trade will be 1500 tons daily. The cost of opening and equipping the Sugarite mine is $176,945. The total length of entries driven is 17,592 ft.

Railroad Betterments—The wooden bridges on the railroad were repaired with treated piling. There were 35,000 new ties put in, replacing the ties which were laid at the construction of the road in 1906 and 1907. The winter and spring were unusually stormy and wet, with much snow on the east end of the line particularly, causing increased expense of operating and necessitating additional ballasting in many places.

Financial Notes

The following table gives the range of various active coal securities and dividends paid during the week ending Nov. 23:

Stocks

Company	High	Low	Last
American Coal Products	94	94	94
American Coal Prod. Pref.	113	113	113
Col. Fuel & Iron	37	36	36¾
Consolidation Coal of Md.	103¾	103¼	103¼
Island Creek Coal Pref.	87¼	87¼	87¼
Lehigh Valley Coal Sales	235	240	240
Pittsburg Coal	24	23	24
Pittsburg Coal Pref.	94	92½	93
Pond Creek	27¾	27	27
Reading	173	169¾	171¼
Reading 1st. Pref.	91½	91	91½
Reading 2nd. Pref.	95	95	95
Virginia Iron C. & C.	64	64	64

Bonds Company	Closing Bid	Asked	Weeks Range or Last Sale	
Colo. F. & I. gen. s f g 5s	98	....	98¾	Sept. '12
Colo. F. & I. gen. 6s	108	108½	107¼	June '12
Col. Ind. 1st & coll. 5s. gu.	83½	Sale	83½	
Cons. Ind. Coal Me. 1st 5s.	....	84	85	June '11
Cons. Coal 1st and ref. 5s.	....	94	93	Oct. '12
Gr. Riv. Coal & C. 1st g 6s.	96	100	102¾	Apr. '06
K. & H. C. & Co. 1st s f g 5s.	98	....	98	Oct. '12
Pocah. Con. Coll. 1st. s f 5s.	85	86	87¾	Nov. '12
St. L. Rky. Mt. & Pac. 1st 5s.	81	Sale	81	
Tenn. Coal gen. 5s	101¾	Sale	101½	101½
Birm. Div. 1st consol. 6s.	102	103½	102½	Nov. '12
Tenn. Div. 1st g 6s	102	103¾	102¼	Oct. '12
Cah. C. M. Co. 1st g 6s.	103½	110	110	Jan. '09
Utah Fuel 1st g 5s	....	....	....	....
Victor Fuel 1st s f 5s	....	85	85¼	Oct. '12
Va. I. Coal & Coke 1st g 5s.	97	97½	97	97

Reading Co. (second preferred)—Regular quarterly of 1%, payable Jan. 9, to holders of record, Dec. 24.

St. Louis Rocky Mountain & Pacific Co.—Dividend on preferred of 1¼%, payable Dec. 31, to holders of record, Dec. 10.

The Mahoning Coal Railroad—This company declared the usual semiannual dividend of $5 a share on its common stock, payable Aug. 1, to holders of record July 15. The regular semiannual dividend of 2½ per cent. on the preferred was also declared payable July 1 to holders of record July 20.